

2014 Annual Progress Report

**NASA Ames Groundwater
Treatment System**

**Regional Groundwater Remediation
Program**

**National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA**

April 2015



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Regional Groundwater Remediation Program

Prepared for:

**National Aeronautics and Space Administration
Ames Research Center
Moffett Field, CA**

April 2015

Prepared by:



**Earth Resources Technology, Inc.
NASA Ames Research Center
Moffett Field, California 94035-1000**



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Brian David Reddig, PG
Certificate No. 7143

Date


<small>STATE OF CALIFORNIA</small> dca <small>DEPARTMENT OF CONSUMER AFFAIRS</small>		BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS 2535 CAPITOL OAKS DRIVE, SUITE 300 SACRAMENTO, CA 95833-2944 916 263-2222	
		PROFESSIONAL GEOLOGIST	
CERTIFICATE NO.		7143	EXPIRATION
BRIAN DAVID REDDIG			08/31/16
5304 MAKATI CIR			
SAN JOSE CA 95123			
Signature	<u>Brian David Reddig</u>		RECEIPT NO.
			42270849



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List of Acronyms

<	less than
AOI	Area of Investigation
bgs	below ground surface
COCs	chemicals of concern
CPT	cone penetrometer testing
CY	calendar year
DCA	dichloroethane
DCE	dichloroethene
EKI	Erler & Kalinowski, Inc
EPA	Environmental Protection Agency
ERT	Earth Resources Technology, Inc.
ft.	feet
GAC	granular activated carbon
gpm	gallons per minute
GWTS	Groundwater Treatment System
HRS	Hazardous Ranking System
LSI	Listing Site Inspection
MCL	maximum contaminant level
MEW	Middlefield-Ellis-Whisman
NASA	National Aeronautics and Space Administration
NPDES	National Pollutant Discharge Elimination System
PCE	tetrachloroethene
RGRP	Regional Groundwater Remediation Program
RWQCB	Regional Water Quality Control Board
TCE	trichloroethene
µg/L	micrograms per liter
VOC	volatile organic compound
VTOL	vertical takeoff and landing
WATS	West-Side Aquifer Treatment System



1 Introduction

On behalf of the National Aeronautics and Space Administration (NASA) Ames Research Center (Ames), Earth Resources Technology, Inc. (ERT) has prepared this 2014 Annual Progress Report for the NASA Ames Groundwater Treatment System (GWTS) associated with the Regional Groundwater Remediation Program (RGRP).

The purpose of this facility-specific Annual Progress Report is to:

- Summarize NASA's Groundwater Remediation activities for calendar year 2014 (CY2014).
- Present groundwater chemical and water level data collected during CY2014.
- Provide a technical assessment and document the effectiveness of NASA's Groundwater Treatment System in meeting remedy objectives.
- Provide conclusions and recommendations.
- Provide NASA's anticipated and proposed CY2015 activities.

1.1 Site Background

NASA Ames is a federal aerospace facility located near the southern end of the San Francisco Bay and the northern end of Santa Clara County (Figure 1), approximately 40 miles south of San Francisco adjacent to the cities of Mountain View and Sunnyvale, California. NASA Ames Research Center (NASA Ames) consists of the original Ames Campus and the portion of Former Naval Air Station Moffett Field shown on Figure 2.

Since 1988, numerous investigations have been performed at NASA Ames to study suspected sources of soil and groundwater contamination. During 1992, Erler & Kalinowski, Inc. (EKI, 1992) completed an EPA Listing Site Inspection (LSI). The primary objective of the 1992 LSI was to generate a preliminary site ranking using the revised Hazardous Ranking System (HRS) developed by the EPA. Based on the final HRS score of 15.77, the NASA Ames site was classified as a non-NPL site.

Additional site work was completed in 1994. The "*Center-Wide Sampling and Analysis Program*" (EKI, 1994a) provided an overview of the requirements for a comprehensive site evaluation. As part of this plan, NASA Ames was divided into Areas of Investigation (AOIs) for detailed studies that are in various stages of characterization, cleanup, or have received closure.



Figure 1
Location Map of NASA Ames



Figure 2
Aerial View of NASA Ames



In 1998, NASA entered into an *“Allocation and Settlement Agreement For Remedial Program Management Between NASA and Fairchild Semiconductor Corporation, Raytheon Company, and Intel Corporation”* (NASA, 1998), which pertained to requirements established under the *“Record of Decision”* for the Middlefield-Ellis-Whisman (MEW) Study Area (EPA, 1989). Under this Agreement, various geographical divisions of responsibility, chemicals of concern, and treatment system design, installation, operations and maintenance responsibilities were allocated between the Parties (MEW, Navy, and NASA). NASA’s Area of Responsibility for the cleanup of volatile organic compounds in groundwater is shown on Figure 3.

1.2 Site Hydrogeology

NASA Ames lies at the northern end of the Santa Clara Valley along the southwestern rim of San Francisco Bay. The Santa Clara Valley is located between the Santa Cruz Mountains to the west and the Diablo Range to the east. The area is underlain by a sequence of Pliocene-Pleistocene and Upper Quaternary unconsolidated sediments up to 1,500 feet thick. Sediments underlying NASA Ames were derived from the Santa Cruz Mountains and deposited in alluvial, estuarine and sublittoral environments. Additionally, fine-grained sediments were transported by waters of the San Francisco Bay.

Underlying NASA Ames are alluvial or fluvial aquifers separated by lower permeability silts and clays. These aquifers are divided into two sequences based on the location of a laterally-extensive clayey layer which separates the shallower, unconfined or semi-confined sequence from the deeper, confined sequence. The shallower sequence consists of the “A” and “B” aquifers, while the lower sequence is comprised of the “C” and “Deep” aquifers. Groundwater is encountered at the site from 4 to 8 feet below ground surface (bgs). Groundwater generally flows to the northeast.

The “A” aquifer consists of stringer-like alluvial channel deposits composed of sand and gravel inter-bedded with fine-grained flood plain deposits. These channel deposits, oriented generally south to north, provide complex pathways for groundwater and contaminant transport. Although the degree of channel continuity is variable, the depositional environment of the A1 aquifer materials has been interpreted as a low-lying flood basin subject to periodic flooding events (PRC, 1997). The A1 aquifer extends from about 5 to 25 feet bgs. Most of NASA Ames groundwater monitoring wells have been installed to monitor contaminants in the A1 aquifer. A few wells have been screened in the deeper A2 aquifer, which generally extends from 30 to 50 feet bgs. According to the *“West-Side Aquifer Treatment System, Long-Term Groundwater Monitoring Plan”* (PRC, 1997), the A1 aquifer is separated from the A2/B1 aquifer by a discontinuous, lower permeability horizon located between 25 and 30 feet bgs.

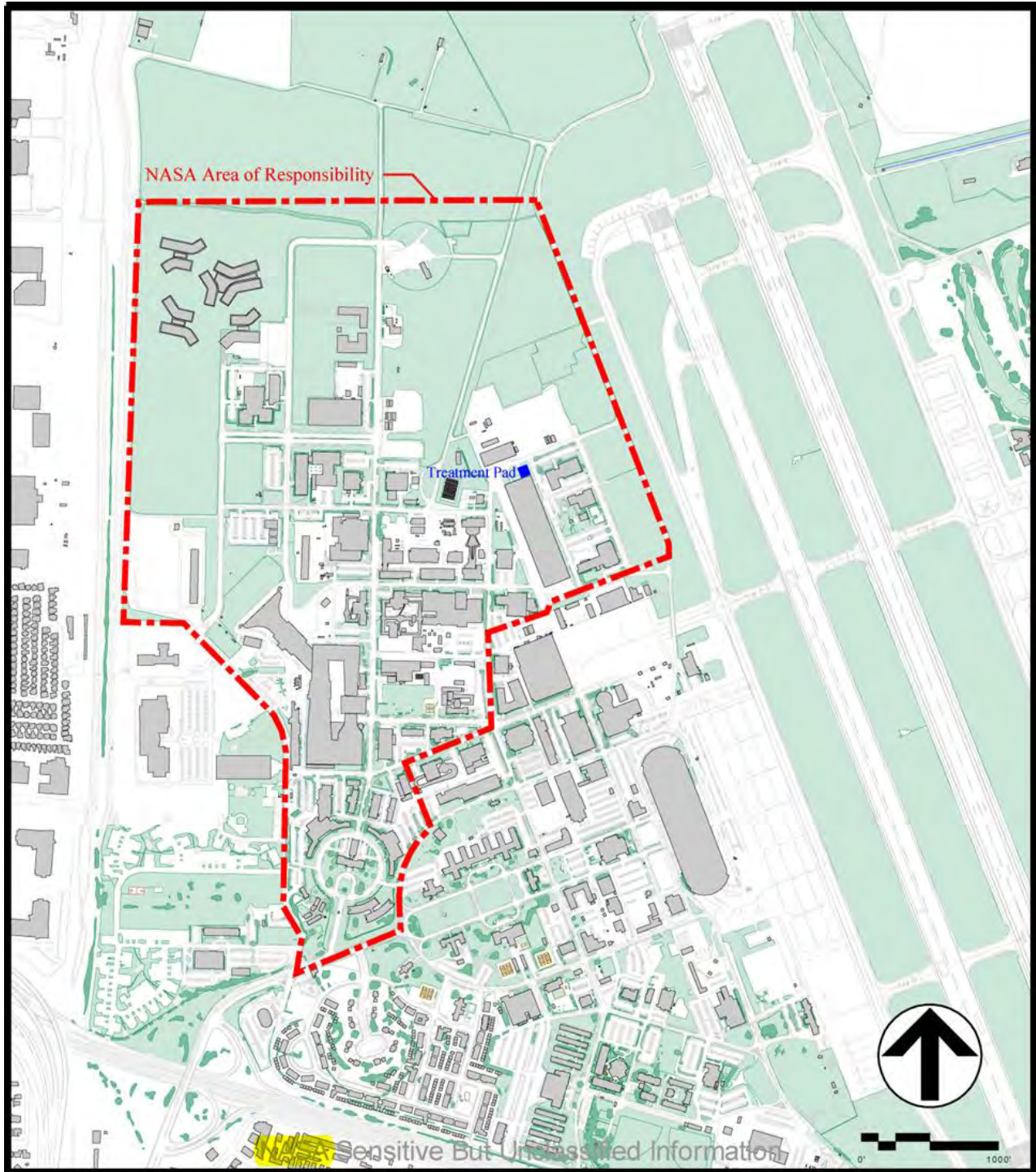


Figure 3
NASA Ames Groundwater Clean-Up Area of Responsibility
for Volatile Organic Compounds



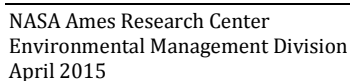
Groundwater flow in the A1 aquifer is greatly affected by the presence of engineered structures in the subsurface (deep, gravel-filled pipe trenches; compacted, engineered fill; and building basements). At the northern edge of NASA Ames, the alluvial aquifers interfinger with relatively impermeable marine and estuarine sediments that restrict groundwater flow towards San Francisco Bay.

1.3 Remedy Description and Remedial Action Summary

The remedial objective of NASA's GWTS is treatment and hydraulic containment of VOC-contaminated groundwater down-gradient from known and/or suspected sources located within NASA's Area of Responsibility. The GWTS addresses two primary areas associated with the Regional Plume.

1. NASA extraction wells NASA-1A and NASA-2A are located near building N240, north of building N211 (Figure 4). Although historic soils data do not identify a source in local soils, historical groundwater data available during the time of the design phase for the *North of US Highway 101 RGRP* (Smith, 1996) indicated the presence of TCE in groundwater at concentrations above cleanup levels in this area. Wells NASA-1A and NASA-2A were installed in 2000 and groundwater extraction was initiated in late 2001. Pumping from NASA-2A was suspended on April 28, 2009 with approval from the EPA and RWQCB.
2. NASA extraction wells NASA-3A and NASA-4A are located down-gradient from a known source area in the vicinity of Navy Site 8 North and NASA's Vertical Takeoff and Landing (VTOL) Pad. Historical information and site investigation data revealed contamination of both soil and groundwater in this area where drums of miscellaneous oils and solvents had previously been stored by the Navy. Previous actions by NASA in this area included the removal of both contaminated soil (excavation and disposal) and groundwater (excavation pit dewatering, treatment, and discharge). Wells NASA-3A and NASA-4A were installed in 2000 and groundwater extraction began in late 2001. Pumping from NASA-4A was suspended on April 28, 2009 with approval from the EPA and RWQCB.

The effectiveness of the remedy is monitored using a network of RGRP monitoring wells. Currently, NASA samples 13 RGRP long-term monitoring wells annually (September). NASA's two operating extraction wells are sampled quarterly. The locations of these wells are shown on Figure 4. In CY2014, eight of NASA's non-RGRP monitoring wells were also sampled in September to provide additional chemical data within NASA's Area of Responsibility. In addition, NASA samples five RGRP wells on behalf of the Parties in September of each year.





1.4 CY2014 Site Activities and Deliverables Summary

NASA activities associated with the RGRP performed during CY2014 are provided in Table 1.

Table 1
CY2014 Site Activities and Deliverables Summary

Activity	Date
Continuing GWTS system operations	On-Going
Monthly GWTS NPDES Sampling	January 22, 2014
Quarter 4, 2013 NPDES Self-Monitoring Report	January 13, 2014
2013 Annual NPDES Self-Monitoring Report	January 30, 2014
Monthly GWTS NPDES sampling	February 25, 2014
Regional depth-to-water gauging	March 20, 2014
Quarter 1 extraction well sampling	March 25, 2014
Monthly GWTS NPDES sampling	March 25, 2014
2013 Annual NASA Facility-Specific Progress Report	April 15, 2014
Monthly GWTS NPDES sampling	April 22, 2014
Quarter 1, 2014 NPDES Self-Monitoring Report	April 30, 2014
NASA GWTS carbon replacement	May 15, 2014
Monthly GWTS NPDES sampling	May 28, 2014
Submitted A2-Aquifer Assessment Work Plan to EPA	May 30, 2014
Quarter 2 extraction well sampling	June 24, 2014
Monthly GWTS NPDES sampling	June 24, 2014
Received EPA approval of A2-Aquifer Assessment Work Plan	June 25, 2014
Monthly GWTS NPDES sampling	July 23, 2014
Quarter 2, 2014 NPDES Self-Monitoring Report	July 24, 2014
Conducted A2-Aquifer Assessment field investigation	July 28-August 1, 2014
Monthly GWTS NPDES sampling	August 26, 2014
Regional depth-to-water gauging	September 18, 2014
Monthly GWTS NPDES sampling	September 23, 2014
Quarter 3 annual RGRP groundwater sampling	September 29-30, 2014
Monthly GWTS NPDES sampling	October 22, 2014
Quarter 3, 2014 NPDES Self-Monitoring Report	November 3, 2014
Monthly GWTS NPDES sampling	November 18, 2014
Monthly GWTS NPDES sampling	December 9, 2014
Quarter 4 extraction well sampling	December 22, 2014
NASA GWTS carbon replacement	December 23, 2014



2 CY2014 Remedial Action Progress

This section provides a greater level of detail regarding the NASA GWTS activities, performance and remedial progress. Included in the progress assessment are discussions of the performance of NASA's GWTS, hydraulic control and capture zone analysis, and groundwater chemical data evaluation and trend analysis.

2.1 Remedial Action Objective

The remedial objective of the NASA GWTS is to extract and treat contaminated groundwater and provide hydraulic containment of contaminated groundwater within NASA's Area of Responsibility associated with the RGRP. The site VOC groundwater cleanup levels, which are based on Federal/State drinking water maximum contaminant levels, are shown in Table 2.

Table 2
Groundwater Cleanup Levels

Chemical	Cleanup Level (µg/L)
1,1-DCA	5.0
1,1-DCE	6.0
1,1,1-TCA	200
1,2-DCA	0.50
<i>cis</i> -1,2-DCE	6.0
<i>trans</i> -1,2-DCE	10
Chloroform	80
Freon 11	150
Freon 113	1,200
PCE	5.0
TCE	5.0
Vinyl Chloride	0.50

µg/L = micrograms per liter

2.2 Groundwater Extraction and Treatment System Description and Performance

NASA's groundwater treatment facility is located at the corner of North Warehouse Road and H Lane (Figure 5). Quarterly and annual CY2014 system Operations and Maintenance (O&M) reports were prepared in accordance with the Self-Monitoring Program reporting requirements contained in the National Pollutant Discharge Elimination System (NPDES) Permit Number CAG912002 (VOC and Fuel General Permit, Order R2-2012-0012, CIWQS Place Identification 243875), issued by the California Regional Water Quality Control Board (RWQCB) to NASA on August 25, 2014. For reference, a copy of the *2014 Annual NPDES Self-Monitoring Report for the NASA Ames RGRP GWTS* (ERT, 2015a) is attached as Appendix A.

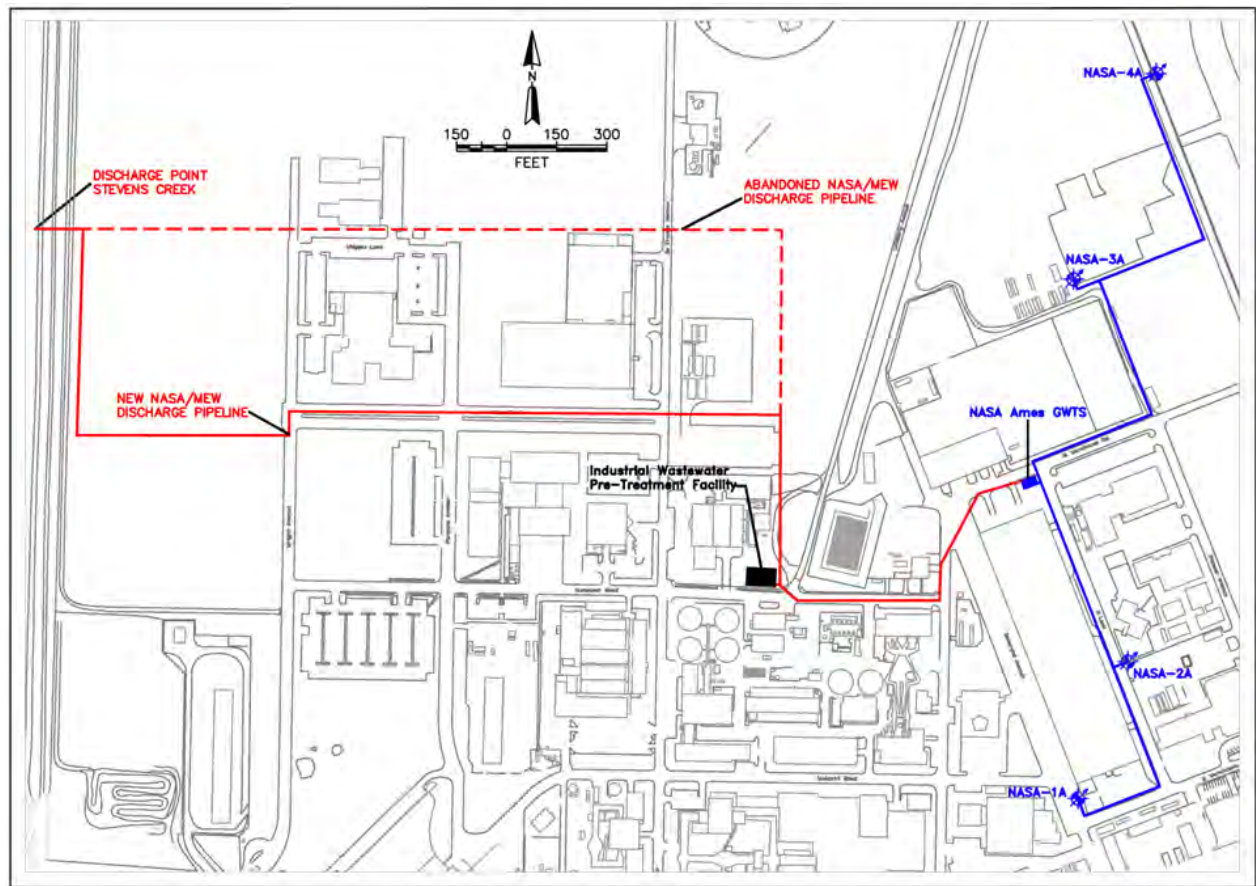


Figure 5
NASA Ames GWTS Location and Layout



2.2.1 System Description

Groundwater extracted from NASA extraction wells NASA-1A and NASA-3A is pre-filtered by two 10-micron bag filters operating in parallel prior to passing through two 5,000-pound granulated activated carbon vessels operating in series. Treated groundwater is then discharged to Stevens Creek in accordance with the NPDES permit. Figure 5 shows NASA's extraction wells and the discharge route to Stevens Creek. NASA's GWTS started operations on September 10, 2001.

2.2.2 NASA Extraction Well Pump Rates

During the CY2014 reporting period, the pump rates for NASA-1A and NASA-3A were periodically adjusted. The pump rate of NASA-1A was increased to maximize mass removal in the area of highest groundwater VOC concentrations. The pump rate of NASA-3A was increased to expand the area of capture and hydraulic containment. Table 3 summarizes the designed pump rates, average annual flow rates and total gallons extraction during CY2014. Pumping from extraction wells NASA-2A and NASA-4A was suspended in April, 2009 with approval from the EPA and RWQCB. .

Table 3
NASA Extraction Well Pump Rate Details

Well ID	Designed Pump Rate (gpm)	Average Annual Pump Rate (gpm)	Total Gallons Extracted in 2014
NASA-1A	8.0	9.1	4,789,062
NASA-2A	3.0	0	0
NASA-3A	6.0	5.8	3,045,647
NASA-4A	3.0	0	6

gpm = gallons per minute



2.2.3 System Influent and Effluent Data

During CY2014, the NASA GWTS removed a total of 4.06 pounds of total VOCs from 8,335,505 gallons of groundwater. This compares to 4.25 pounds of VOCs removed from 7,764,941 gallons of groundwater in CY2013. The average flow rate into the system was 15.9 gpm, compared to 14.8 gpm in CY2013. Figure 6 presents the monthly effluent flow for CY2014. Since pumping began in CY2001, the NASA GWTS has removed 65.4 pounds of total VOCs from 103 million gallons of groundwater.

The monthly influent VOC concentrations for selected chemicals are presented in Figure 7, and Figure 8 presents the monthly total VOC and TCE mass removal information for CY2014. The average total VOC influent concentration in CY2014 was 57.91 $\mu\text{g/L}$, compared to 65.56 $\mu\text{g/L}$ in CY2013. The influent and effluent analytical data for NASA's monthly NPDES compliance sampling is provided in the *2014 Self-Monitoring Report* (Appendix A).

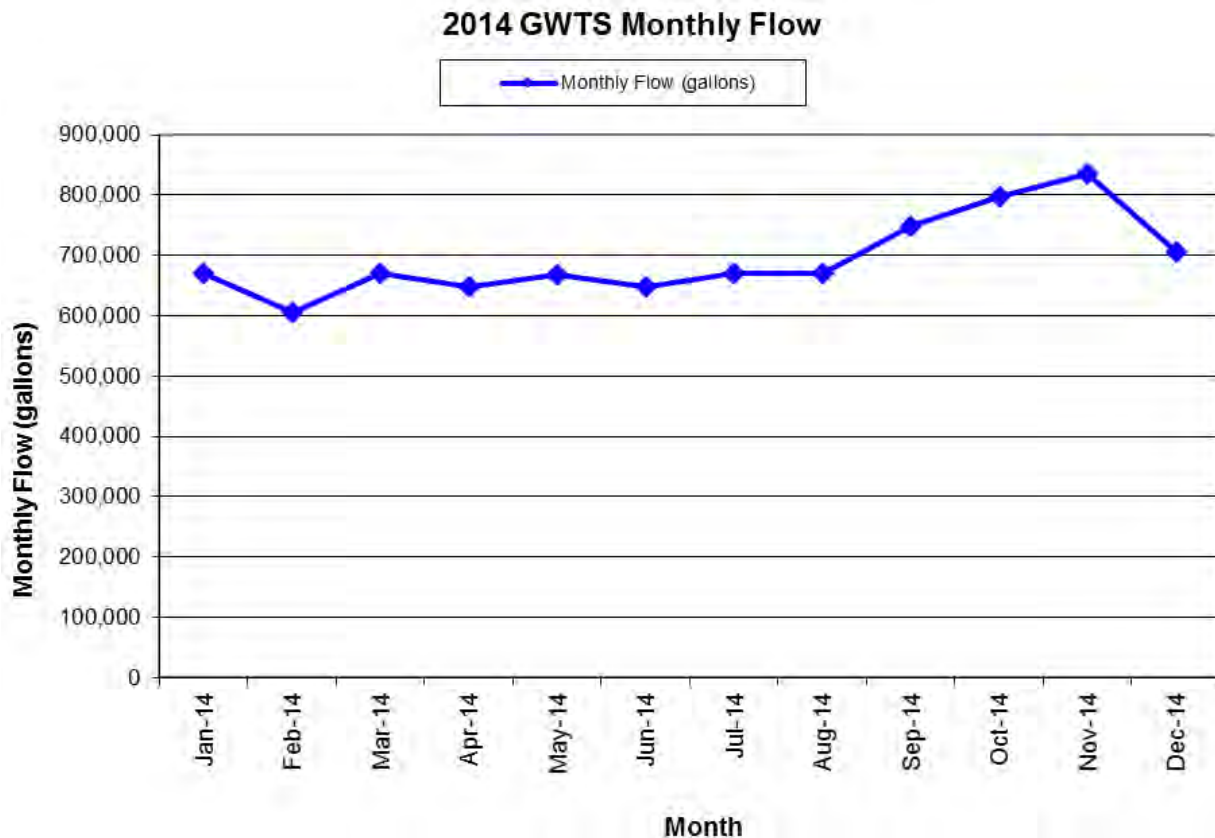


Figure 6
CY2014 GWTS Monthly Groundwater Extraction Volume

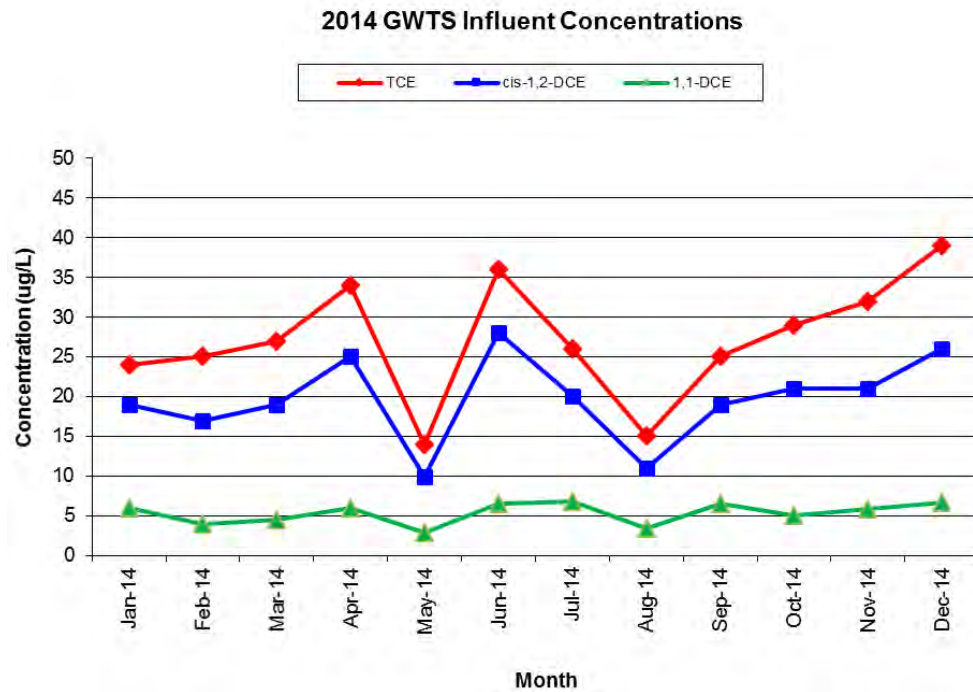


Figure 7
CY2014 GWTS Monthly Influent VOC Concentrations

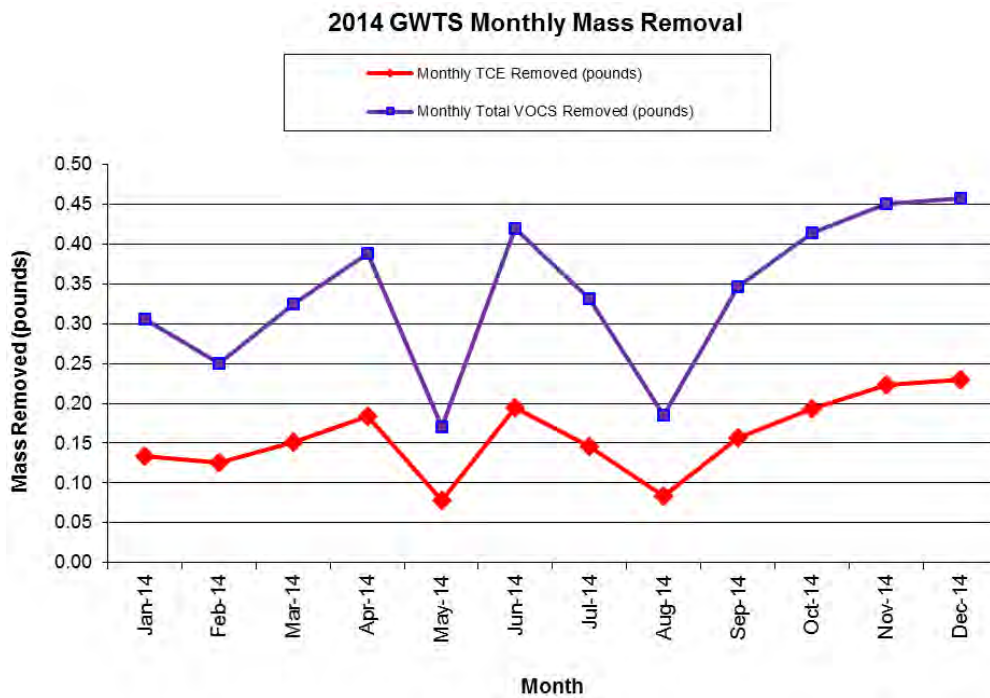


Figure 8
CY2014 GWTS Monthly Mass Removal



2.2.4 System Performance

The NASA GWTS was operational for 98.8% of CY2014. The GWTS was fully operational (both extraction wells operating) for 98.0% of the year, partially operational (only one extraction well operating) for 0.7 % of the year and not operating (no extraction wells operating) for 1.2% of CY2014.

During CY2014, the NASA GWTS experienced several automatic and manual system-wide shutdowns. These automatic system-wide shutdowns resulted from problems with electrical systems and/or faulty sensors. The manual shutdowns occurred during GAC change-outs and maintenance activities. Dates and durations of these shutdowns are detailed in the *2014 Self-Monitoring Report* (Appendix A).

2.2.5 System Operations and Maintenance

During CY2014, NASA's GWTS treated influent groundwater as designed. A summary of the maintenance activities is provided below.

Granular Activated Carbon Replacements

On May 15, 2014, the GAC within vessel GAC-552 was replaced. Vessel GAC-552 served as the secondary GAC vessel from November 16, 2012 to October 29, 2013 (11 months of service) and served as the primary GAC vessel from October 29, 2013 to May 15, 2014 (7 months of service). No system shutdown was required during the carbon replacement and associated system maintenance activities.

On December 23, 2014, the GAC within vessel GAC-551 was replaced. Vessel GAC-551 served as the secondary GAC vessel from October 29, 2013 to May 15, 2014 (7 months of service) and served as the primary GAC vessel from May 15, 2014 to December 23, 2014 (7 months of service). No system shutdown was required during the carbon replacement and associated system maintenance activities.

2.3 Hydraulic Control and Capture Zone Analyses

The following sections describe how the capture zones for NASA's groundwater extraction wells were estimated and discuss the effectiveness of the capture zones. Capture zones have been estimated for NASA's two active extraction wells using flow net analyses of March 20 and September 18, 2014 groundwater elevation data and potentiometric surfaces in the A1 aquifer. NASA Ames extraction wells are completed in the A1 aquifer; therefore, the following sections are relative only to the A1 aquifer.



2.3.1 Analysis Methodology

The capture zone of an extraction well may be interpreted graphically from the shape of the potentiometric surface. The shape of the potentiometric surface is influenced by many factors, especially the extraction well zone of influence, aquifer/aquitard heterogeneities, geologic materials, and discharge/recharge boundaries.

The flow net analysis method provides a simple graphical solution that reflects site-specific aquifer heterogeneities and hydraulic interference effects from other extraction wells that cannot be incorporated into an analytical estimate of capture zones without the development of an extensive groundwater model. The limitation of using flow-net analysis is that groundwater flow and contaminant transport through preferential pathways and “channelized” groundwater flow is not adequately reflected (e.g. effects may be minimized).

The evaluation of the hydraulic capture and containment is based on the following site data reviews:

- Water level data
- Chemical concentrations
- Extent of dissolved chemicals of concern (COCs) exceeding cleanup standards
- Hydraulic capture and control of plumes
- Groundwater balance in extraction well capture zones

2.3.2 Groundwater Level Monitoring

NASA, the Navy and the MEW companies collect semi-annual groundwater elevation data on a pre-arranged day. Depth-to-water measurements were recorded for NASA Ames monitoring wells in the A1 aquifer as part of the MEW site data exchange program. Depth-to-water measurements from 76 monitoring wells were collected by NASA on March 20 and September 18, 2014 and are included in Appendix B. These data were used to generate groundwater hydrographs and elevation contour maps of the A1 aquifer.

2.3.2.1 Hydrographs

Hydrographs were prepared from the groundwater elevation data to aid in the evaluation of site-specific and seasonal trends and to illustrate the hydraulic impact of groundwater extraction. The hydrographs are included in Appendix C.



All of the A1 aquifer monitoring wells exhibit seasonal groundwater elevation trends. During the wet season (November 2013 through March 2014), groundwater levels rose an average of 0.91 feet, ranging from 0.18 feet to 1.95 feet. During the dry season (April 2014 through September 2014), groundwater levels dropped an average of 1.21 feet, ranging from 0.73 feet to 1.87 feet. Overall, groundwater levels dropped an average of 0.25 feet from CY2013 to CY2014.

2.3.2.2 Horizontal and Vertical Gradients

Depth-to-water measurements collected on March 20 and September 18, 2014 (Appendix B) were used to generate groundwater elevation contour maps of the A1 aquifer (Figures 9 and 10, respectively). The following sections provide a discussion of the groundwater gradients estimated for each gauging event.

March 20, 2014 Data Interpretation

A groundwater elevation contour map was generated from water levels measured on March 20 and is shown on Figure 9. Groundwater generally flows north-northeast. The average horizontal gradient was approximately 0.0030 feet/foot (ft/ft). The groundwater gradient in the southern portion of NASA Ames (south of Hunsaker Road) was approximately 0.0050 ft/ft, while the average gradient in the northern portion was approximately 0.0016 ft/ft.

The vertical gradient between the A1 aquifer and A2 aquifer in the vicinity of NASA-1A was estimated using the groundwater elevation data for well pair 14D25A2/14D26A1. A local upward groundwater gradient of 10.93 feet existed between the A2 aquifer and the A1 aquifer at this well pair, located within 10 feet of extraction well NASA-1A. Prior to groundwater extraction, this well pair indicated a local upward gradient of about 1.0 foot. While well 14D26A1 experienced a noticeable response to initiation of pumping, well 14D25A2 exhibited little response.

September 18, 2014 Data Interpretation

A groundwater elevation contour map was generated from water levels measured on September 18 and is shown on Figure 10. Groundwater generally flowed north-northeast at an average horizontal gradient of approximately 0.0033 ft/ft. During this quarter, the groundwater gradient in the southern portion of NASA Ames was approximately 0.0057 ft/ft, while the average gradient in the northern portion was approximately 0.0017 ft/ft.

The vertical gradient between the A1 aquifer and A2 aquifer in the vicinity of NASA-1A as measured on September 18 in well pair 14D25A2/14D26A1 was 10.75 feet.



Figure 9
A1-Aquifer Groundwater Elevation Contour Map
March 20, 2014

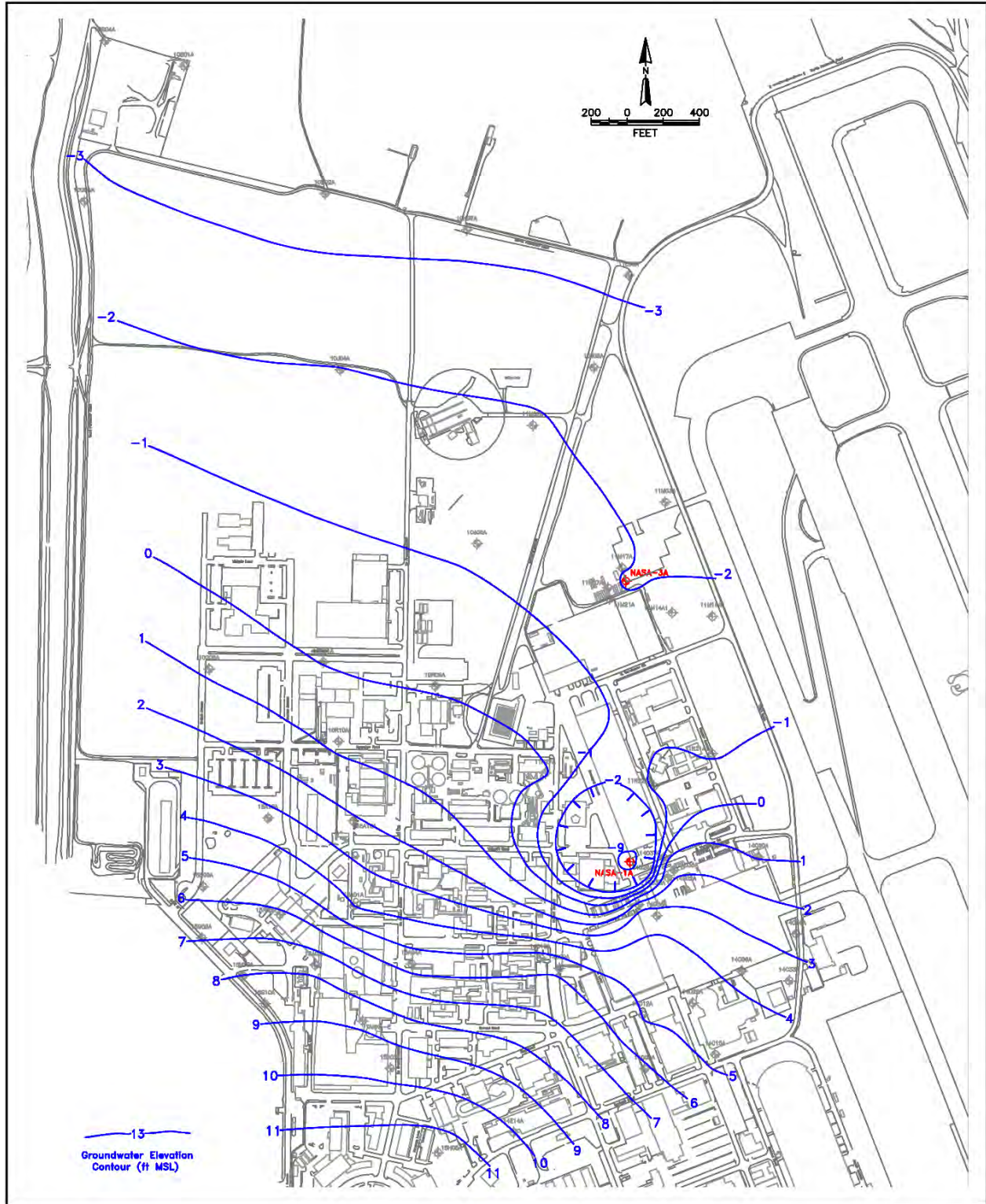


Figure 10
A1-Aquifer Groundwater Elevation Contour Map
September 18, 2014



2.3.3 Estimated 2014 Capture Zones

The NASA GWTS was designed to address two areas that were discussed in the *Proposed Locations of NASA Ames Groundwater Extraction Wells in the VTOL Pad and South Navy Warehouse Areas* (EKI, 1995). The first area of concern is located south of the former Navy Warehouse (building N144), between buildings N240 and N259. Although no soil source area was identified during groundwater investigations conducted in CY1994, contouring of TCE concentrations in groundwater in this area suggested a potential source area of TCE contamination in the A1 aquifer. However, recent plume mapping and concentration data indicate that the plume in this area is a continuation of the Regional Plume. NASA extraction wells NASA-1A and NASA-2A were installed in the A1 aquifer to address this area.

The second area is located down-gradient of Navy Site 8 North, near the southwest corner of the Vertical Take-Off and Landing (VTOL) pad. As documented in the *Center-Wide Sampling and Analysis Program, Volume VII: Work Plan for Area of Investigation 7* (EKI, 1994b), the likely source of any solvent contamination to groundwater in this area was from chemicals previously located at the Navy Site 8 storage areas. In 1994, NASA removed solvent-contaminated soil exceeding cleanup levels by excavating over 3,000 cubic yards of soil (*Site 8-North Soil Excavation & Source Removal* (NASA, 1994). The area of excavation is shown in Figure 11. NASA extraction wells NASA-3A and NASA-4A were installed in the A1 aquifer to address residual groundwater contamination down-gradient of this area.

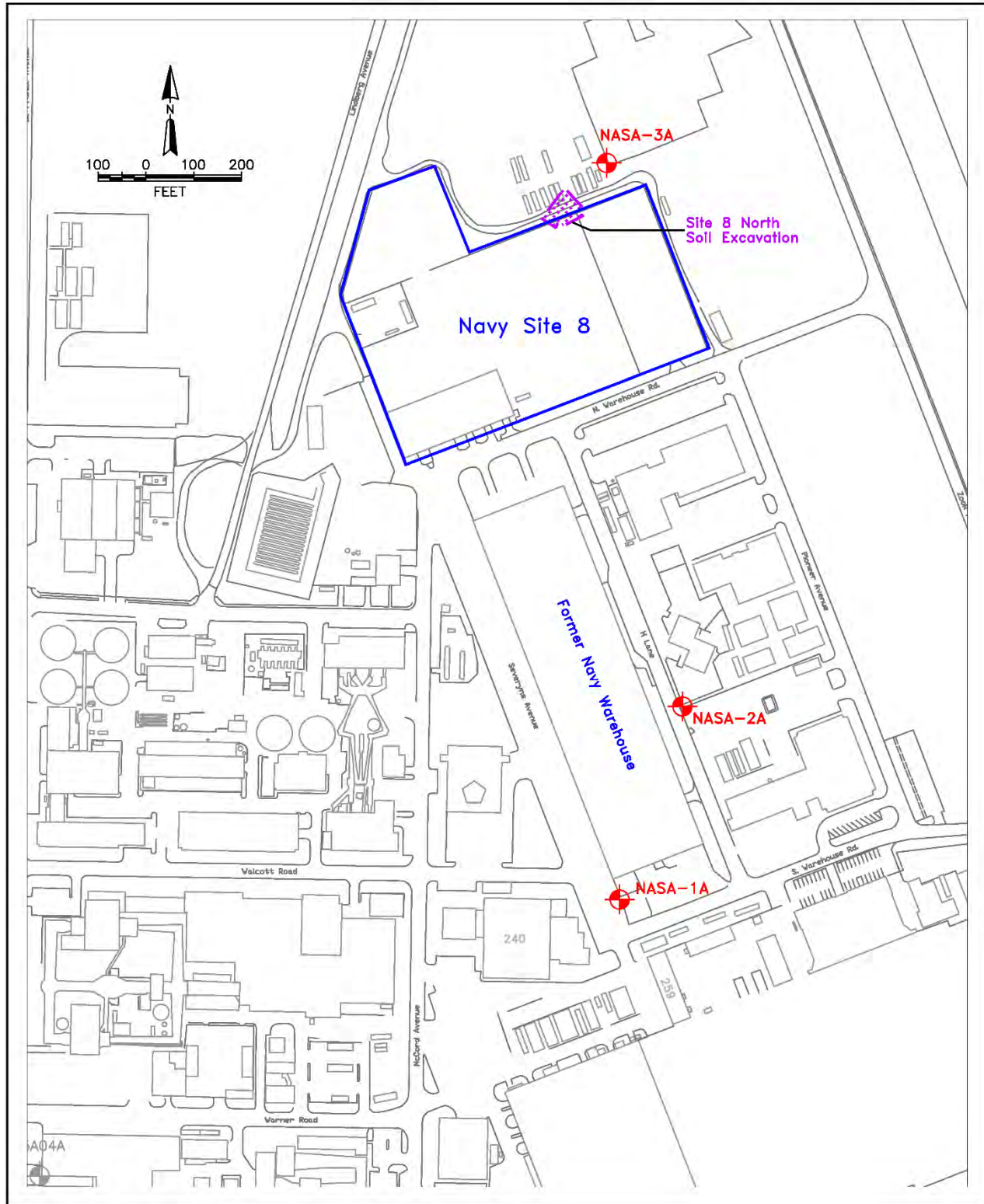


Figure 11
Areas Addressed by NASA GWTS



2.3.3.1 Flow Budget Calculations

A horizontal capture zone analysis was completed to estimate the capture widths at extraction wells NASA-1A and NASA-3A (Table 4). Since there is no overlapping capture between the two wells, individual pump rates were used, as opposed to a combined pumping rate appropriate for overlapping capture.

Since NASA-1A and NASA-3A were installed as source control wells and were not intended to address the larger Regional Plume area, separate calculations were performed. For the "Source Control" calculations, the "measured plume width" refers to the permeable channel deposits in which the up-gradient source areas and extraction wells are located. For the "Regional Plume" calculation, the "measured plume width" refers to the widest portion of the mapped CY 2014 TCE plume (Figure 14) adjacent to each extraction well. The saturated thickness at each extraction well represents the maximum thickness of aquifer materials at each location.

The channel width data and hydraulic conductivities used for the "Source Control" calculations were obtained from *Proposed Locations of NASA Ames Groundwater Extractions Wells in the VTOL Pad and South Navy Warehouse Areas* (EKI, 1995). The hydraulic conductivities for the "Regional Plume" calculations were estimated to be half of the "Source Control" hydraulic conductivities to reflect capture outside of the coarser-grained channel sediments. The hydraulic gradients were obtained from measurements from the March 20 and September 18, 2014 groundwater elevation contour maps (Figures 9 and 10, respectively).

Assumptions required for the calculations include: 1) homogeneous, isotropic, confined aquifer of infinite extent; 2) no net recharge; 3) uniform aquifer thickness; 4) fully penetrating extraction well; 5) steady-state flow; and 6) negligible vertical gradient.

The results in Table 4 indicate that the predicted capture width at NASA-1A is greater than both the "Source Control" channel deposit width and "Regional Plume" trans-gradient TCE plume width. Based on associated chemical data from NASA-1A, the data supports that groundwater capture and mass removal is occurring from within the channel boundaries and hydraulic containment of the Regional Plume is occurring outside the channel boundaries. At NASA-3A, the results indicate that at the current pumping rate, the predicted capture width is sufficient for groundwater capture and mass removal of the contaminated groundwater migrating from the source area, but is inadequate to provide hydraulic control of the entire Regional Plume mass. Additional discussion of the NASA-3A area is provided in Section 7.3.



Table 4
Flow Budget Calculations

Parameter	NASA-1A Source Control	NASA-1A Regional Plume	NASA-3A Source Control	NASA-3A Regional Plume
Q (gpm)	9.1	9.1	5.8	5.8
b (ft)	12	12	14	14
i (ft/ft)	0.0042	0.0042	0.0015	0.0015
k (ft/day)	150	75	150	75
Calculated Capture Width (ft)	232	463	354	709
Measured Plume Width (ft)	123	414	163	1,094

Q = pumping rate

b = saturated aquifer thickness

i = regional hydraulic gradient

k = hydraulic conductivity

Calculated Capture Width = $Q/(k \times b \times i)$

Measured Plume Width = widest point at extraction well from 2014 TCE concentration contour map (Figure 14) or channel deposits width from EKI, 1995.

1 cubic foot = 7.48 gallons

1 day = 1,440 minutes

2.3.3.2 Interpreted Actual Capture

To best characterize the hydrogeology that controls the performance of NASA's extraction wells, the "Distribution of Sand and Gravel Thickness" maps from the 1995 EKI "proposed locations" document were used to create Figure 12. As shown on the figure, there are depositional trends where relatively permeable sandy and gravelly sediments were deposited adjacent to, or incised within, silty and clayey sediments. Based upon the thicknesses and distributions of these differing sediment types, especially the linear nature of the sand and gravel sediment trends, these sediments were most likely deposited originally by stream or "channelized" flow. It is assumed that there is an appreciable amount of inter-connection among the sand and gravel deposits within a channel boundary.



NASA-1A Extraction Well

NASA-1A is located in an approximately 120-foot wide channel deposit (Figure 12) and is screened across approximately 4 feet of fine- to medium-grained sand, 2 feet of coarse-grained sand, and 4 feet of fine-grained gravel.

Although the flow-net based capture zone of NASA-1A supports that NASA-1A is providing hydraulic containment at the fuel-impacted wells, it appears that the fuel contamination in this adjacent channel sequence has limited ability to migrate across the channel boundary to the NASA-1A extraction well. Actual mass removal of the petroleum hydrocarbons and VOCs is restricted by the channel boundaries.

NASA-2A Extraction Well

NASA-2A is located down-gradient from NASA-1A. According to the 1995 EKI report, NASA-2A is in the same channel as NASA-1A, but at a location where the channel has narrowed to approximately 90 feet in width and has thinned somewhat (Figure 12). The extraction well is screened across approximately 4 feet of fine- to medium-grained silty and clayey sands, inter-bedded with clays and silts. Pumping at NASA-2A was suspended on April 28, 2009 because of poor performance.

NASA-3A Extraction Well

NASA-3A is located immediately down-gradient from Navy Site 8 North in an approximately 175-foot wide channel deposit (Figure 12) comprised of thick, coarse sand and gravels. NASA-3A is screened across approximately 5 feet of fine- to medium-grained silty sand, 4 feet of medium- to coarse-grained sand and 2 feet of sandy gravel.

Although the extraction rate from this well is 5.8 gpm, little draw-down is observed in the adjacent groundwater monitoring wells. High hydraulic conductivity at this location allows for relatively high groundwater extraction rates, but makes lateral capture difficult, especially when considering the relatively large width of the channel. Because of its proximity to the Navy Site 8 North source area, and the decreasing TCE levels in down-gradient well 11M03A, this well appears to be capturing the majority of the residual dissolved solvents.

NASA-4A Extraction Well

Because of the relatively low sustainable pump rate and concentrations below cleanup levels present at NASA-4A, groundwater extraction was terminated on April 28, 2009.

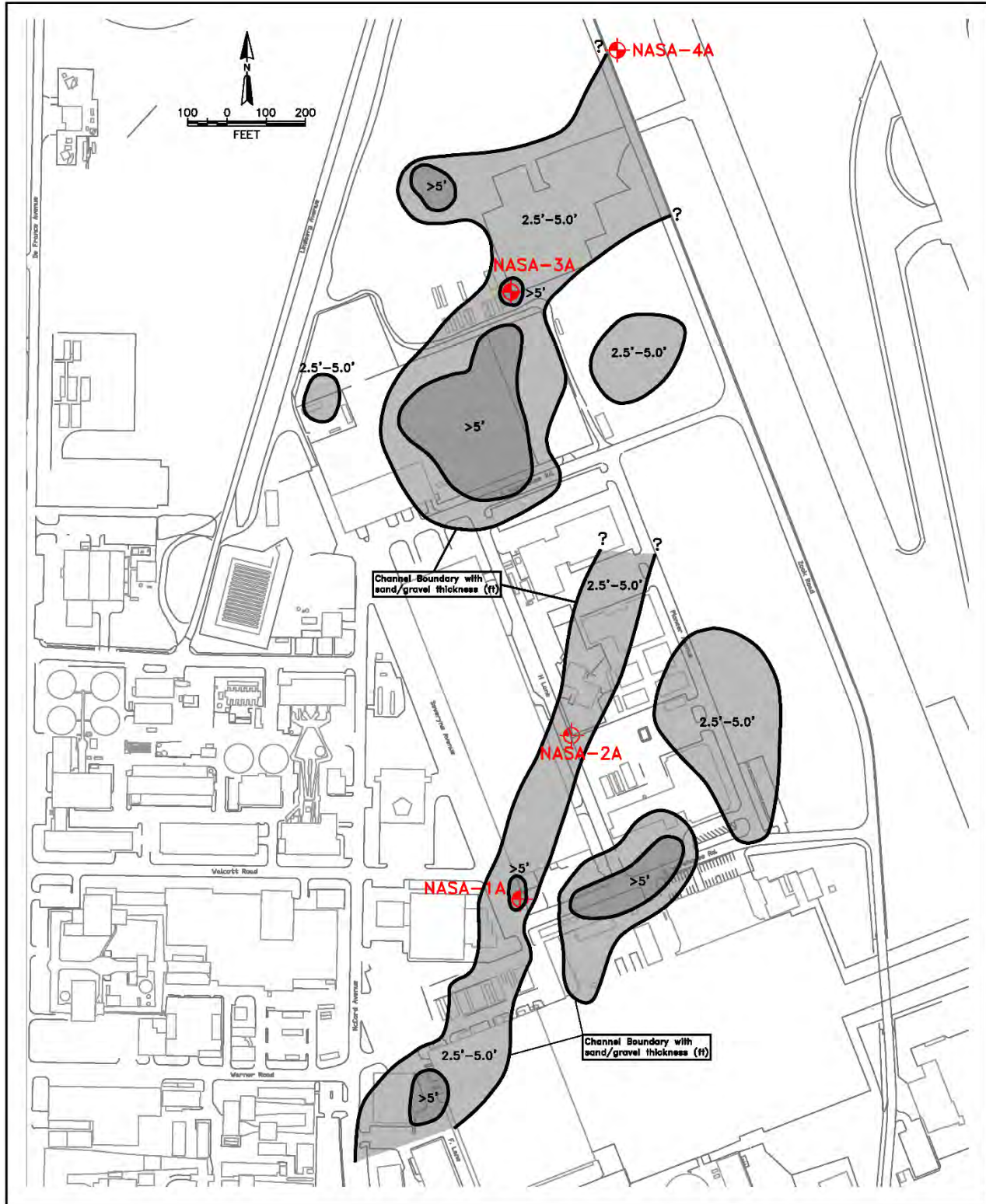


Figure 12
A1-Aquifer Sand & Gravel Thickness Distribution Map



Figure 13 was developed in order to evaluate the impact of the channelized deposition of geologic materials on the interpretation and assessment of remedy performance. Figure 13 was created by superimposing the depositional trends (Figure 12) on the September 18, 2014 groundwater elevation contour map. The solid black lines represent the estimated boundaries of the channel deposits. The channel deposit boundary is based on a sand and gravel thickness of 2.5 feet to 5.0 feet. Areas with sand and gravel thicknesses greater than 5 feet are denoted as ">5'."

Figure 13 shows that wells 14D02A, 14D33A, 14D35A, 14D36A, 14D37A and 14D39A should be within the flow-net based capture zone of NASA-1A. These monitoring wells have historically contained elevated concentrations of various fuel constituents. During CY2014, JP5/JP8 was detected in well 14D37A at a concentration of 850 µg/L. However, jet fuel has not been detected in groundwater samples collected from NASA-1A. This highlights one of the limitations of using flow-net analysis to determine capture zones.

The red-shaded area represents the effective area of contaminant mass removal at NASA-1A based on the geologic controls created by the channelized deposition of coarse-grained materials. This interpretation accurately explains the absence of significant petroleum hydrocarbon concentrations in NASA-1A, which is present at elevated concentrations in adjacent wells located outside of the channel deposits. The dashed red line represents a conservative capture zone based on flow-net analysis. Although the flow-net based capture zone indicates that NASA-1A is providing hydraulic containment of the fuel-impacted wells, it appears that the fuel hydrocarbons in these adjacent channel deposits have limited ability to migrate across the channel boundary to the NASA-1A extraction well. Actual mass removal of the petroleum hydrocarbons is limited by the channel boundaries.

Additional factors influence the effective capture zone at NASA-3A. Although NASA-3A is located where the channel deposits appears to be pinching, the hydraulic conductivity of the channel deposits is very high, resulting in little drawdown in the extraction well and nearby monitoring wells. The flat local gradient, combined with the lack of a mappable radius of influence, prevents the estimation of a capture zone in this area. However, since NASA-3A is located approximately 110 feet directly down-gradient of the Navy Site 8 North excavation site, it can be assumed that most of the residual dissolved contamination from the source area is being captured by this well.

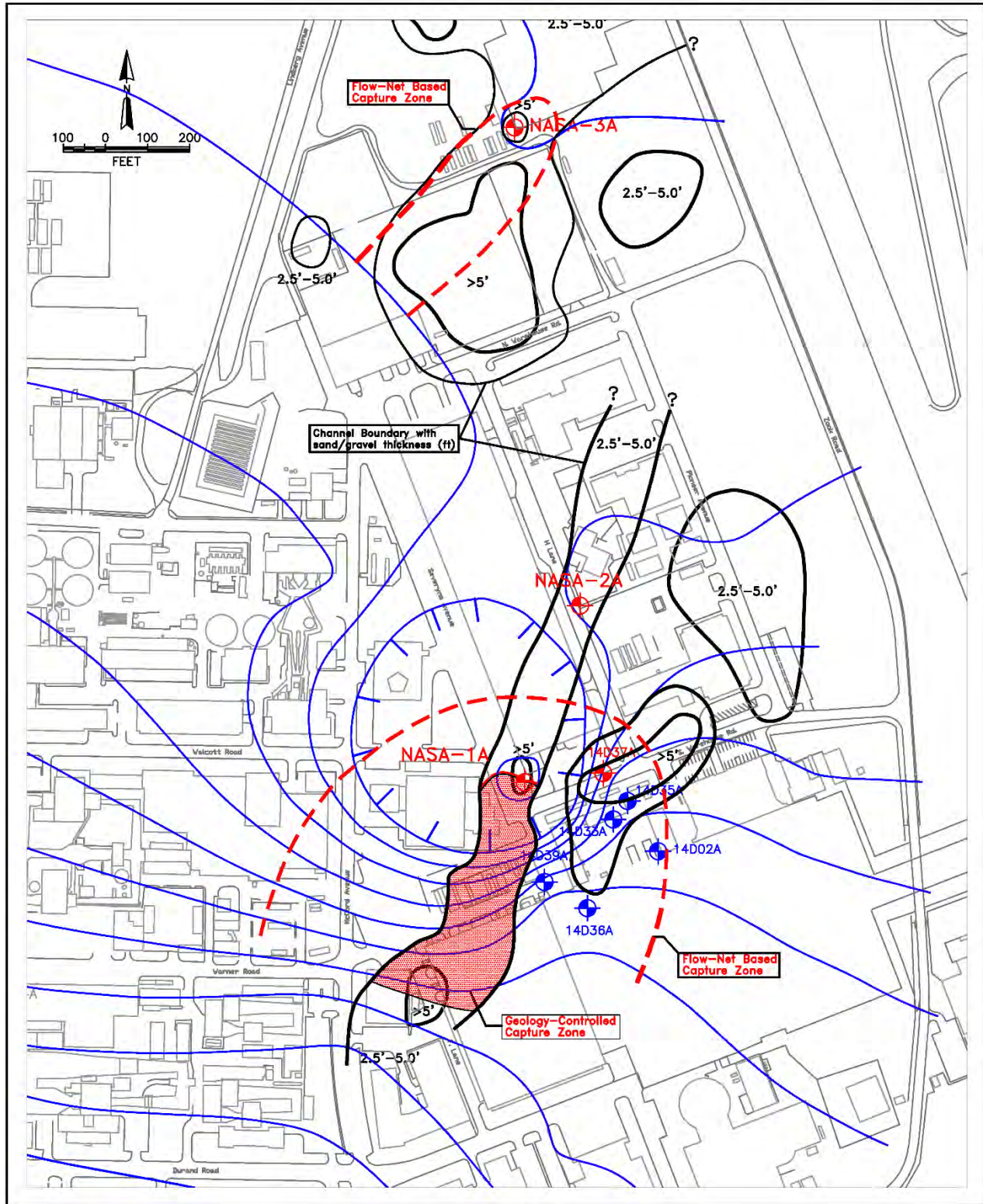


Figure 13
Geology-Controlled Groundwater Capture Map



2.4 Groundwater Quality Monitoring

2.4.1 Chemical Data Evaluation and Trend Analysis

Groundwater quality in NASA's Area of Responsibility has been evaluated to assess conditions during CY2014 and changes that have taken place from previous years. Based on the prevalence of TCE, *cis*-1,2-DCE and vinyl chloride in site groundwater, discussion of these three groundwater contaminants are included in this section. Limiting the analysis to these compounds is appropriate based on the following:

- TCE is specified as the indicator compound in the MEW Record of Decision.
- *Cis*-1,2-DCE is a degradation product of TCE and is present in most wells. At many locations, *cis*-1,2-DCE is present at concentrations greater than TCE. Some locations may contain *cis*-1,2-DCE without detectable TCE concentrations.
- TCE and *cis*-1,2-DCE made up approximately 80 percent of the contaminant mass being removed by the NASA GWTS.
- Vinyl chloride is an indicator of enhanced TCE degradation and is prevalent in areas of VOC and petroleum hydrocarbon co-mingling. Vinyl chloride is often the only remaining VOC in areas of co-mingling.
- Petroleum hydrocarbons are also common contaminants in NASA's Area of Responsibility. Although not directly addressed in this report, reference is made to their occurrence where appropriate.

In CY2014, NASA reduced its sampling frequency from semi-annually to annually to align with the annual RGRP sampling schedule. NASA's RGRP-related sampling event was conducted in September, 2014. A total of 11 NASA RGRP-related wells were sampled (Figure 4). NASA well 14D36A and MEW well 95A, which are usually sampled by NASA, were unavailable for sampling because of the presence of no-purge sampling devices that were installed in the wells by others. NASA also voluntarily sampled eight non-RGRP wells to obtain additional data within and up-gradient of the NASA Area of Responsibility. During the September 2014 sampling event, NASA also collected samples from five RGRP wells on behalf of the Parties. NASA's two operating extraction wells (NASA-1A and NASA-3A) were sampled quarterly.

Analytical data for CY2014 is summarized in Appendix D. Concentration-versus-Time graphs for selected wells are presented in Appendix E. Copies of the laboratory analytical reports and chain-of-custody forms are presented in Appendix F.



2.4.2 Concentration Contour Maps

TCE, *cis*-1,2-DCE and vinyl chloride concentration contour maps were created using the CY2014 analytical data for the A1 aquifer. The concentration contour maps are provided in Figures 14, 15 and 16, respectively. The figures include posted values of the concentration detected during CY2014. The mapped extent shown in each figure is based on the chemical's cleanup level.

The TCE and *cis*-1,2-DCE plumes shown along the western margin of NASA Ames is part of the "Orion Park Plume" and is discussed separately in Section 3.1.

TCE Boundaries

The overall shape and extent of the TCE concentration contours shown in Figure 14 has not changed significantly since CY2004 and are nearly identical to that mapped for CY2013. The sampling of well WSI-04A1 (west of NASA-3) produced results that have extended the plume boundary near the leading edge to the northwest. The western margin of the TCE plume now extends outside of well 14E14A. The highest concentration of TCE in NASA's Area of Responsibility was reported at a concentration of 62 µg/L in well 11N22A1.

Cis-1,2-DCE Boundaries

The overall shape and extent of the *cis*-1,2-DCE concentration contours shown in Figure 15 have not changed significantly since CY2004 and are nearly identical to that mapped for CY2013. The 50 µg/L contour of the *cis*-1,2-DCE plume has receded inside (up-gradient) of extraction well NASA-1A to near well 14D28A. The highest concentration of *cis*-1,2-DCE in NASA's Area of Responsibility was reported at a concentration of 38 µg/L in extraction well NASA-1A.

Vinyl Chloride Boundaries

The overall shape and extent of the vinyl chloride concentration contours shown in Figure 16 have not changed significantly since CY2004 and are nearly identical to that mapped for CY2013. The northeastern leading edge of the vinyl chloride plume has receded inside (up-gradient) of well 14C60A. The highest concentration of vinyl chloride in NASA's Area of Responsibility was reported at a concentration of 1.0 µg/L in extraction well NASA-1A.



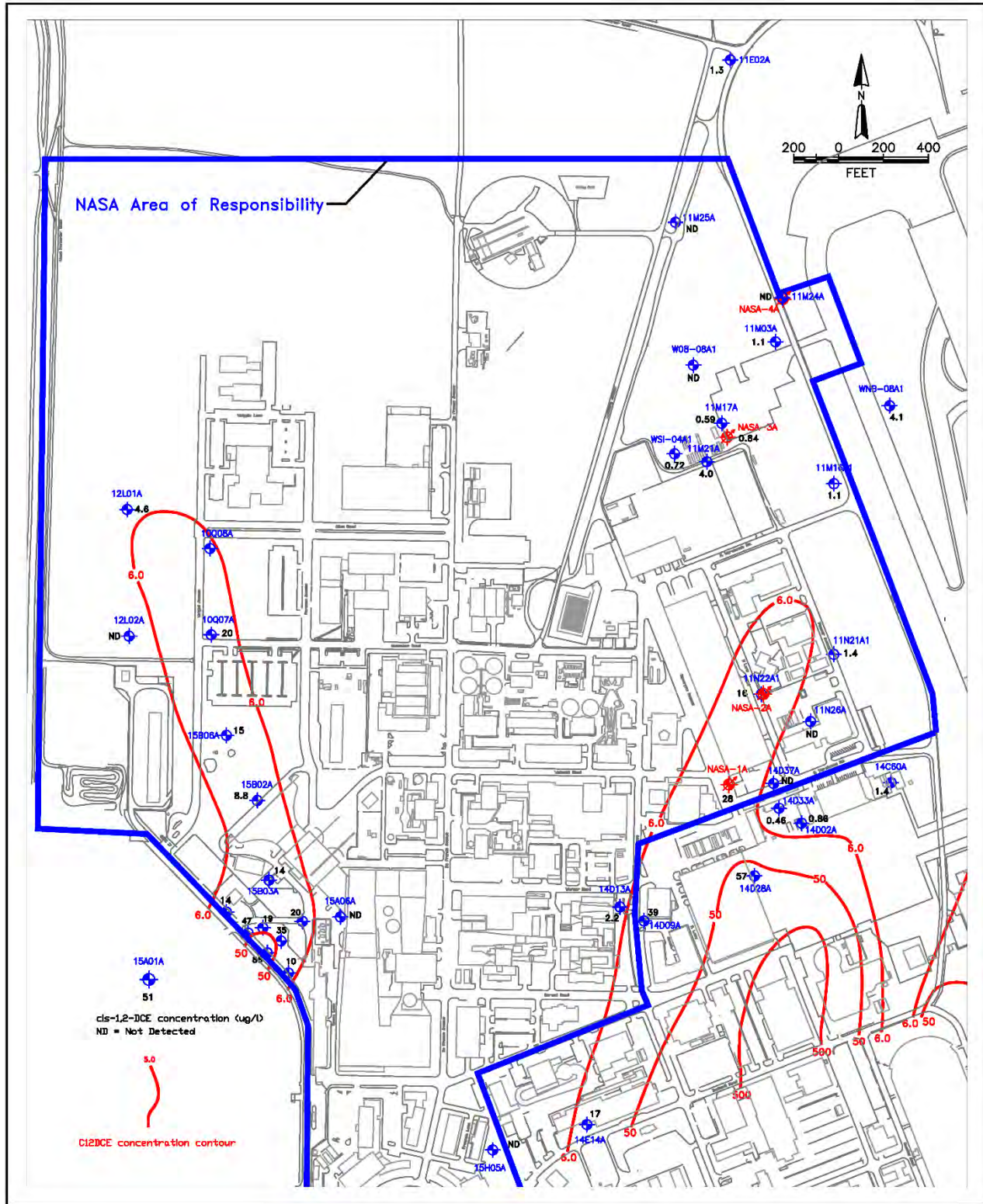


Figure 15
CY2014 Cis-1,2-DCE Concentration Contours, A1 Aquifer

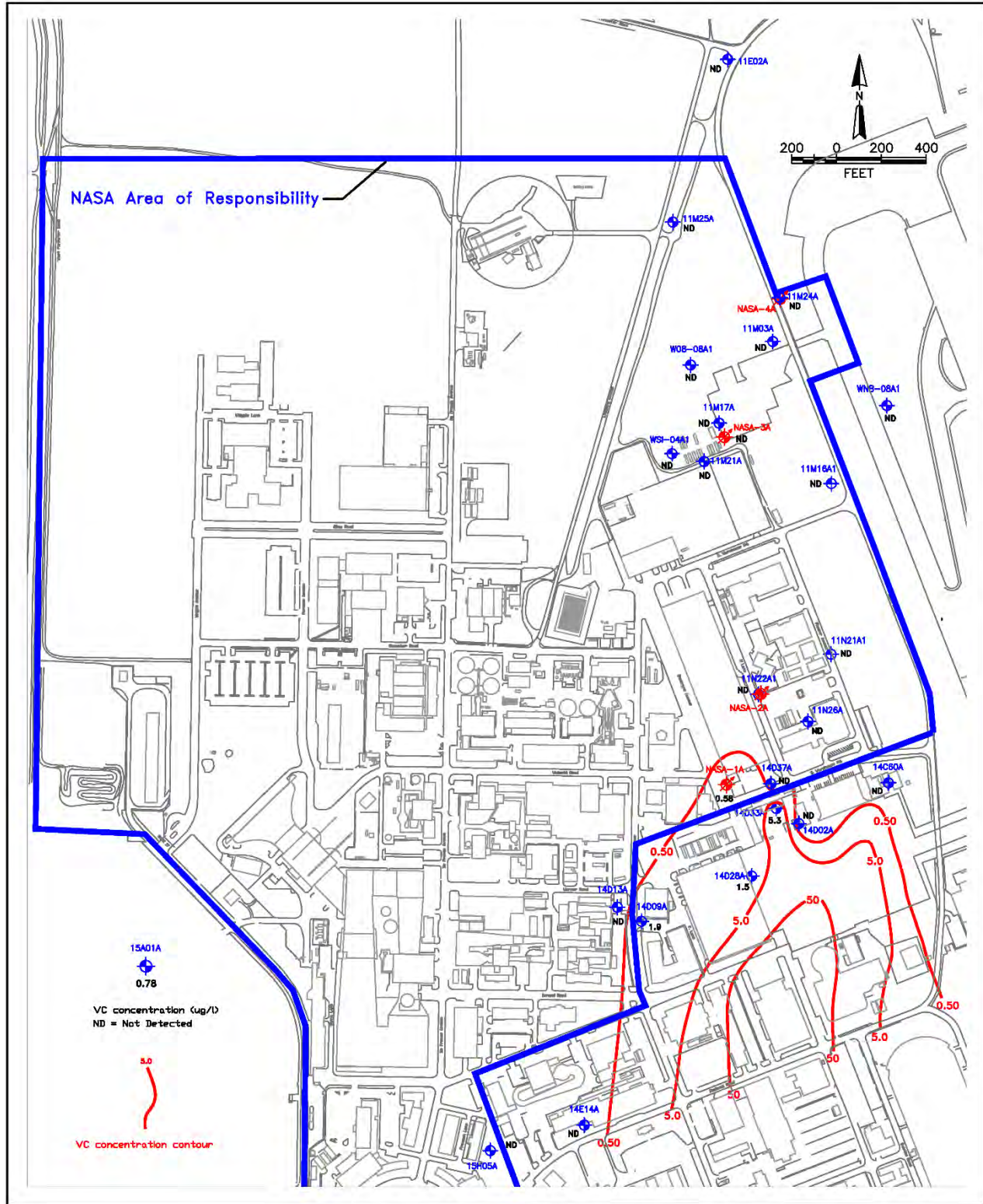


Figure 16
CY2014 Vinyl Chloride Concentration Contours, A1 Aquifer



2.4.3 Concentration Trends

In conjunction with the hydraulic analysis described in Section 2.3, VOC analytical data provides an additional line of evidence for assessing remedy performance. Concentration-versus-time graphs are presented in Appendix E. Figures 17 and 18 show the concentration trends of TCE and *cis*-1,2-DCE in NASA's extraction wells NASA-1A and NASA-3A, respectively. These trends are characteristic of most of the wells in NASA's Area of Responsibility. A rapid reduction in the initial concentrations following the initiation of pumping (CY2002-CY2005) is followed by slower, more gradual concentration declines.

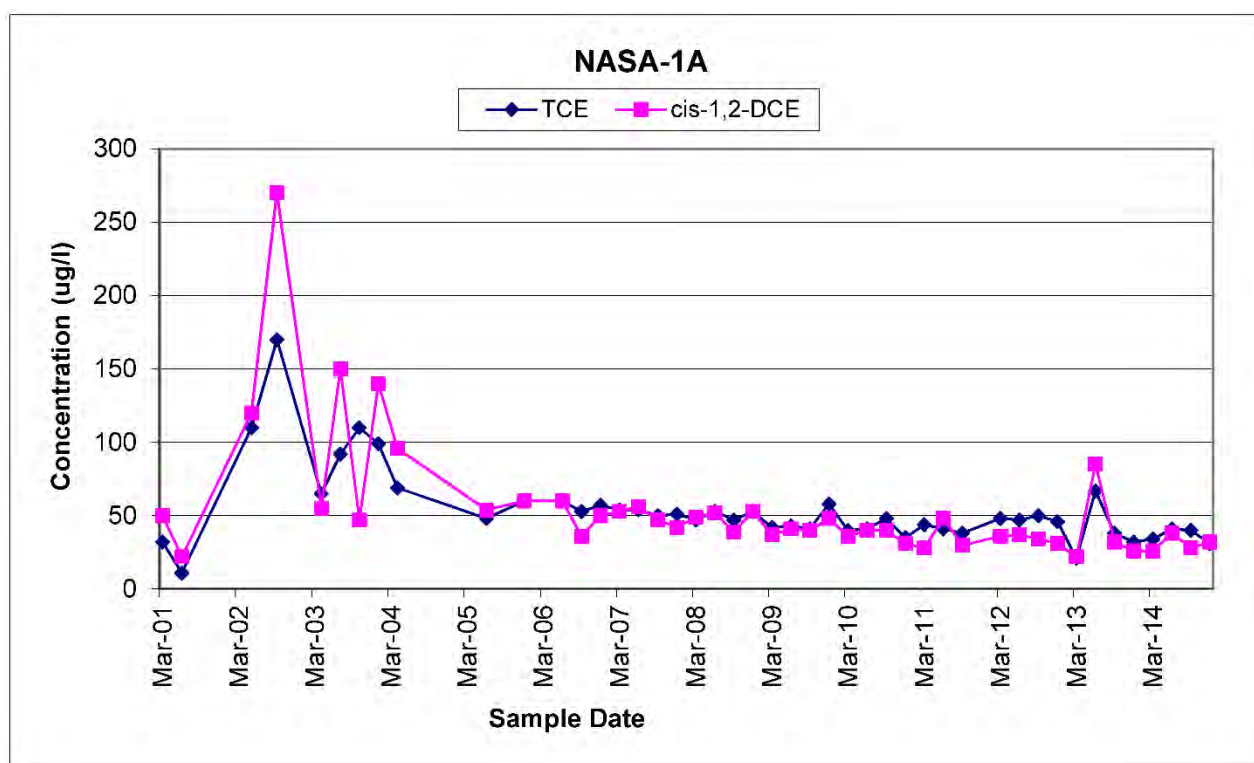


Figure 17
Concentration-versus-Time Graph, Extraction Well NASA-1A

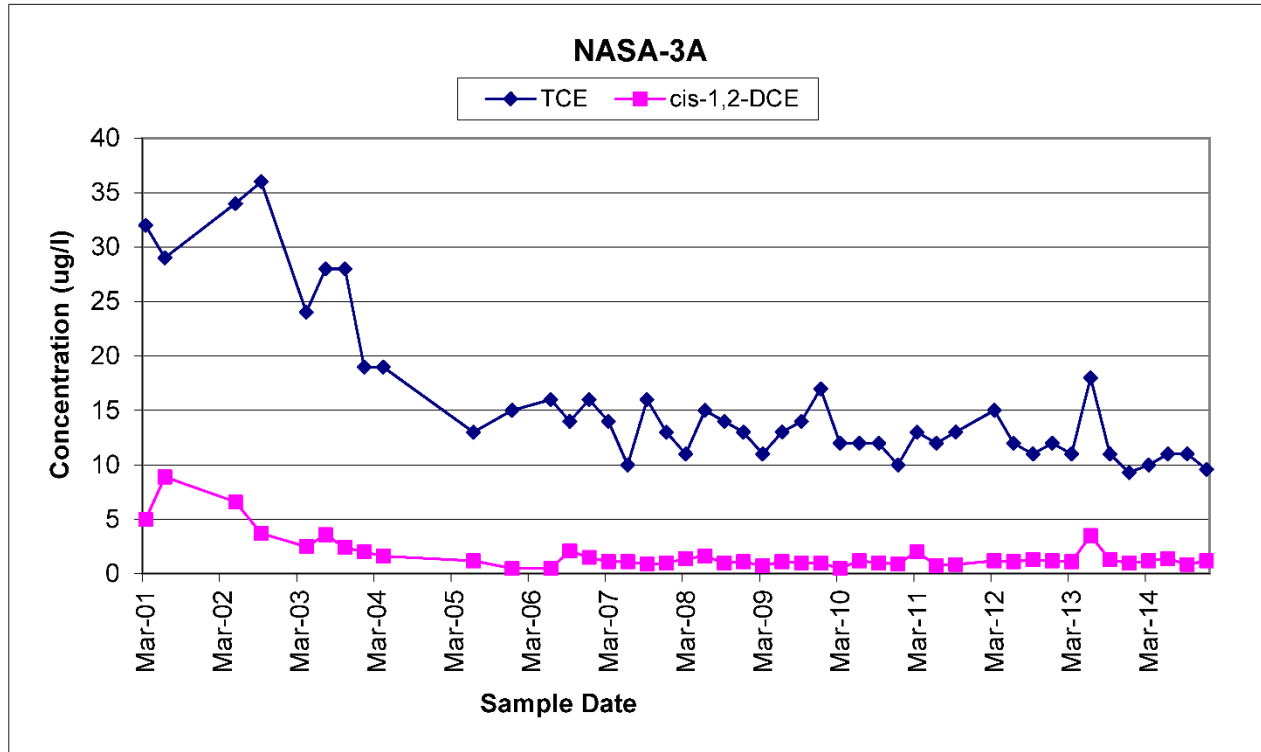


Figure 18
Concentration-versus-Time Graph, Extraction Well NASA-3A

Mann-Kendall trend analysis was applied to select groundwater monitoring wells for TCE, *cis*-1,2-DCE and vinyl chloride (Appendix G). The statistical analysis was conducted for the time period spanning the initiation of NASA groundwater extraction (September 2001) to the present. Based on the Mann-Kendall statistical analysis the TCE concentrations are non-detectable, decreasing, or stable in 94% of NASA's RGRP wells. Approximately 28% of the wells display decreasing TCE concentrations and 67% are non-detectable or stable. *Cis*-1,2-DCE concentrations are non-detectable, decreasing, or stable in 83% of NASA's RGRP wells. Approximately 44% of the wells display decreasing *cis*-1,2-DCE concentrations and 39% are non-detectable or stable. Table 5 presents the Mann-Kendall trend analyses for wells within NASA's Area of Responsibility that are sampled annually or semi-annually by NASA.



Table 5
Mann-Kendall Trend Analysis

Well Name	TCE	<i>cis</i> -1,2-DCE	Vinyl Chloride
11E02A	S	D	ND
11M03A	S	IQD	ND
11M14A1	S	I	ND
11M16A1	S	S	ND
11M17A	I	S	ND
11M18A1	D	S	ND
11M21A	D	D	ND
11M25A	S	ND	ND
11N21A1	S	D	IQD
11N22A1	S	D	IQD
11N26A	ND	ND	ND
14D24A	S	PD	D
14D26A1	S	S	IQD
14D37A	ND	ND	IQD
95A	D	D	IQD
NASA-1A	D	D	D
NASA-3A	D	D	ND
W08-08A1	S	IQD	ND

Notes:

TCE = Trichloroethene

Cis-1,2-DCE = *cis*-1,2-Dichloroethene

ND = Not Detected

IQD = Insufficient Quantifiable Data

S = Stable

I = Increasing

PI = Probably Increasing

D = Decreasing

PD = Probably Decreasing

2.4.4 VOC Spatial Distribution

The spatial distribution of VOCs in groundwater can also be used to assess remedy performance. Figure 19 presents a map of the A1 aquifer capture zone (based on flow-net analysis of the September 18, 2014 gauging data) superimposed on the CY2014 TCE concentration contour map. As shown in Figure 19, NASA-1A is capturing and/or providing hydraulic containment of the TCE plume at the up-gradient edge of NASA's Area of Responsibility. However, at the leading edge of the plume, NASA-3A is only capturing or providing hydraulic control of a portion of the plume. Additional discussion of NASA-3A is provided in Section 7.3.

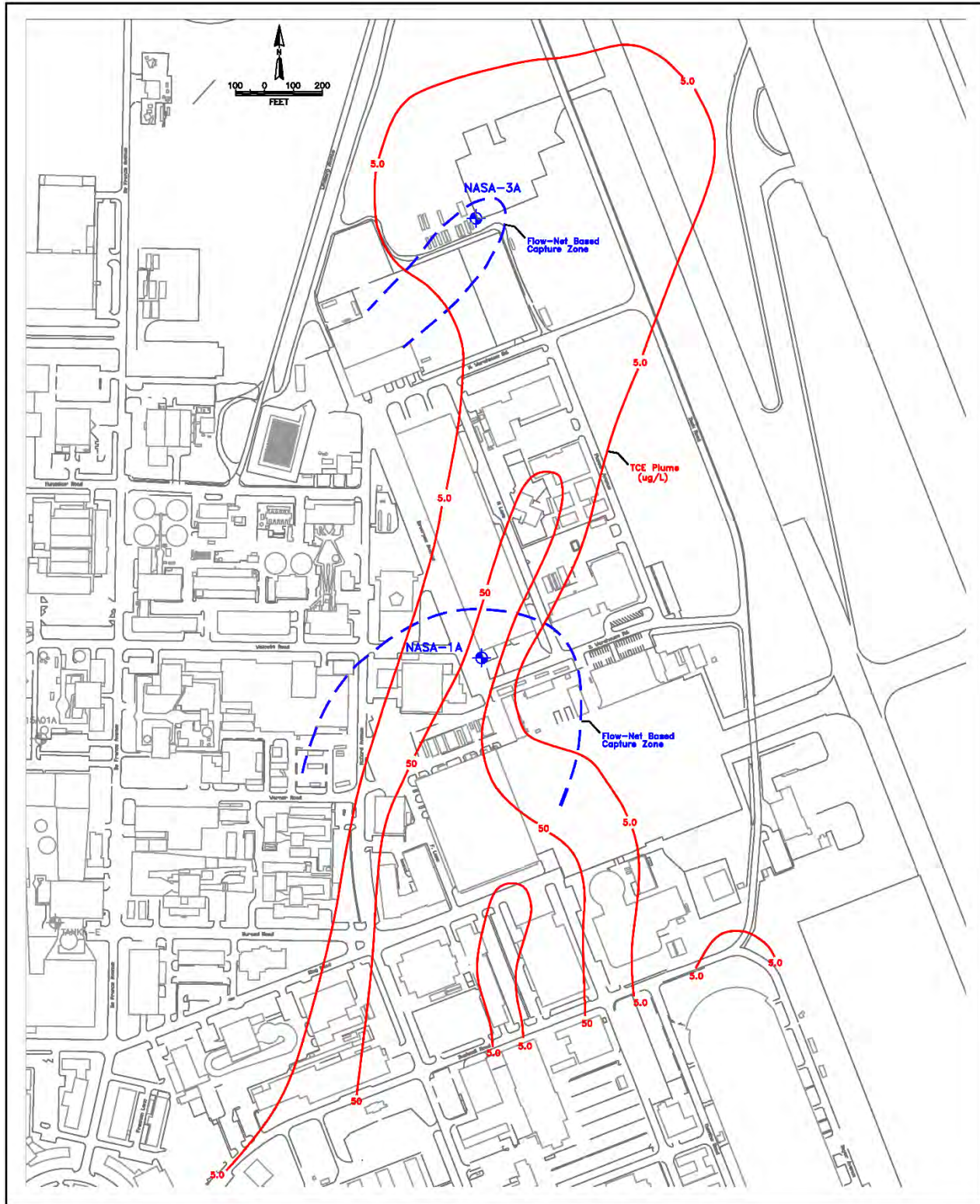


Figure 19
TCE Concentration Contours and Capture Zones, A1 Aquifer



3 Other Activities

3.1 Orion Park Plume

The “Orion Park Plume” is located along NASA’S western property boundary and is named after the Navy’s former Orion Park Housing area (Figures 14 and 15). A number of investigations in and around the former Orion Park Housing area have been conducted by NASA, the Navy, the Air Force, the Army, and the EPA. The majority of the reports conclude that the main source of the plume lays up-gradient of the Housing area. The source of this VOC plume has not been identified.

NASA installed an air sparge/soil vapor extraction barrier along the NASA property boundary and began continuous operation began in CY2008. Details of the system can be found in “*Draft Boundary Treatment Zone, Air Sparge Barrier, Operation and Maintenance Plan*” (TTEMI, 2008).

3.2 A2/B1-Aquifer Plume Definition Assessment

In June, 2014, EPA and the Water Board approved the *Final Work Plan for the Northernmost A2/B1 Aquifer Plume Definition Assessment at NASA Ames Research Center* (ERT, 2014). NASA prepared the Final Work Plan in response to EPA’s request to install a ‘sentinel’ A2/B1 monitoring well within the northernmost area of the Regional Groundwater Plume based on the recommendation provided in *Final Grab-Groundwater Assessment and Proposed Well Installations* (Geosyntec, 2013).

NASA implemented the Final Work Plan in July 2014. However, the leading edge of the VOC plume in the A2/B1 aquifer was not identified, which was the primary objective of the investigation.

On November 17, 2014, NASA met with the EPA and RWQCB to present the July 2014 investigation findings and to discuss the necessary next actions.

On January 14, 2015, NASA submitted an *Amendment to the Final Work Plan* (ERT, 2015b) that addressed the items identified in the November 17, 2014 meeting with the EPA and RWQCB and proposed additional site investigation activities to better identify the leading edge of the A2/B1 plume for placement of a sentinel monitoring well. The *Amendment to the Final Work Plan* contains a summary of the July 2014 investigation. NASA anticipates that the proposed additional investigation will be conducted during CY2015.



3.3 Site 8 North Reconnaissance Sampling

In July, 2014, three CPT/Hydropunch locations were sampled in the vicinity of well WSI-04A1 during the Northernmost A2 Aquifer Assessment field work mobilization. The purpose of this reconnaissance sampling was to obtain additional groundwater quality data up-gradient of well WSI-04A1 and to assist with lithologic mapping in the area. A summary of the findings are presented in Section 7.3.

3.4 Treated Effluent Reuse

Previously, treated water from the MEW and NASA groundwater treatment systems was utilized in NASA's Arc Jet Wind Tunnel cooling towers and boiler or discharged to Stevens Creek. A pipeline was constructed in 1998 for diversion of treated groundwater through the onsite Industrial Waste Water Treatment Plant at N271 for treatment prior to reuse by the Arc Jet facility. From CY2011 through CY2014, modifications were made to the Industrial Waste Water Treatment Plant, preventing the re-use of the treated groundwater. Reuse will resume upon completion of the modifications.



4 Problems Encountered

Sections 2.2.4 and 2.2.5 summarize the operating efficiency and non-routine O&M events that occurred at NASA's GWTS during CY2014. No other problems related to the operation or performance of the GWTS were encountered.



5 Technical Assessment

The following assessment of the groundwater remedy performance was made based on data collected through CY2014.

5.1 Remedy Functionality

NASA-1A and NASA-3A are functioning as designed in that they are both providing adequate horizontal and vertical capture of their targeted treatment areas. While NASA-1A is also providing hydraulic containment of the Regional portion of the plume, NASA-3A is not.

Figure 20 was created to show the relationship between the targeted treatment areas, the depositional environment, the estimated capture zones, and the TCE plume boundary.

5.2 Are Capture Zones Adequate?

At NASA-1A, groundwater elevations, graphical flow net analysis, capture zone width calculations, and VOC concentration trends provide converging lines of evidence that the extraction well is achieving adequate horizontal and vertical capture and/or hydraulic containment of both the suspected source area and Regional Plume in the A1 aquifer.

At NASA-3A, capture zone width calculations and VOC concentration trends indicate that the extraction well is achieving adequate horizontal and vertical capture of the former Navy Site 8 North source area. However, groundwater elevations, graphical flow net analysis, capture zone width calculations, and VOC concentration trends suggest that the low-concentration Regional portion of the plume is not being fully captured or hydraulically contained. However, the incomplete hydraulic containment in this area is not critical because concentration trend analysis and plume mapping indicate that the plume boundaries are stable and the low hydraulic gradient limits potential down-gradient plume migration. Additional discussion regarding NASA-3A is provided in Section 7.3.

5.3 Are Concentrations Decreasing Over Time?

Mann-Kendall trend analysis indicates that TCE concentrations are decreasing or stable in 94% of the evaluated wells in NASA's Area of Responsibility. Approximately 28% of the wells display decreasing TCE concentrations and 67% are stable. *Cis*-1,2-DCE concentrations are decreasing or stable in 83% of the wells. Approximately 44% of the wells display decreasing *cis*-1,2-DCE concentrations and 39% are stable. The average influent concentration to NASA's GWTS has declined from 163.3 µg/L in CY2001 to 57.9 µg/L in CY2014. To illustrate the reduction of concentrations and plume mass over time, plume maps for TCE, *cis*-1,2-DCE, 1,1-DCE, 1,1-DCA, and vinyl chloride were created for calendar years 1995, 2000, 2007 and 2013. The maps are provided in Appendix H. Each contaminant shows a reduction in core concentration, as well as a contraction of plume boundary.

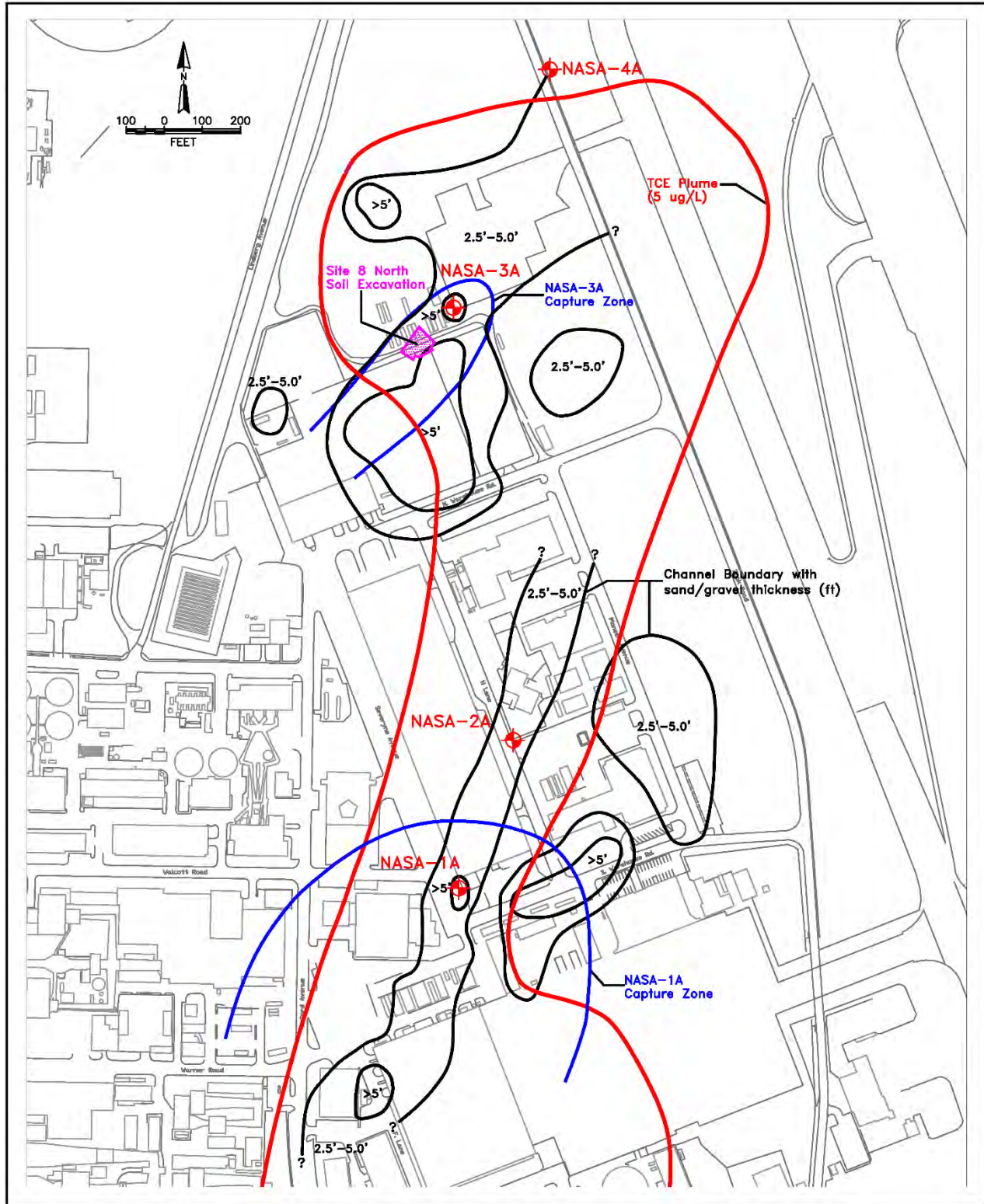


Figure 20
Capture Zone Physical Environment Map



6 Optimization Progress

6.1 Existing Network Optimization

With the replacement of the pump at NASA-1A in March 2013, the mass removal at this location has been maximized. During the dry months (June-October), maximum drawdown of 24 feet was maintained in this well. At the current pumping rate (9.5 gpm), groundwater elevations, graphical flow net analysis, capture zone width calculations, and VOC concentration trends provide converging lines of evidence that the extraction well is achieving adequate horizontal and vertical capture and/or hydraulic containment of both the suspected source area and Regional Plume in the A1 aquifer.

Prior to September 2014, pumping at NASA-3A was limited to between 4.7 and 5.0 gpm to maintain compliance with NASA's NPDES discharge limit of 15 gpm. In August 2014, during the NPDES permit renewal process, NASA's obtained approval from the RWQCB to increase its discharge limit to 20 gpm. This allows extraction at NASA-3A to be maintained between 9 gpm and 10 gpm. The effect of the increased pumping rate can be observed in the Groundwater Elevation Contour Maps presented in Figures 9 and 10, where deflection of the groundwater elevation contours have appeared adjacent to NASA-3A during the September 18 gauging event (Figure 10). Based on evidence discussed in this Report, it appears NASA-3A is providing adequate capture and/or hydraulic containment of the up-gradient Navy Site 8 North residual source area. Because NASA-3A is located in a laterally and vertically extensive deposit of highly permeable sands and gravels, it is unlikely that the increased extraction rate at NASA-3A will be sufficient to provide complete hydraulic containment of the entire Regional Plume in this area. However, the increased capture zone will provide incremental mass removal and hydraulic containment. Because of the stability of the plume, the relatively low VOC concentrations and the flat hydraulic gradient, further down-gradient migration of the plume is limited.

As part of the investigation for locating a new A2/B1-aquifer monitoring well, lithologic and chemical data from the A1 aquifer in the vicinity of extraction wells NASA-1A and NASA-2A were collected to verify the accuracy of the EKI channel mapping (Figure 12) and to evaluate the location of extraction well NASA-1A. Based upon the CPT logs, along with supporting chemical data, the EKI channel mapping was shown to be very accurate and no modifications to the channel boundaries were deemed necessary. NASA-1A is well positioned within the channel deposit, which appears to be the major groundwater transport feature at the up-gradient edge of NASA's Area of Responsibility.



6.2 Future Optimization Efforts

For CY2015, NASA plans to conduct the optimization efforts listed below. Further discussion of these efforts is provided in Section 9.0.

- Continue pumping extraction well NASA-3A at rates between 8 and 10 gpm and evaluate impact of increased pumping rate on capture zone propagation.
- Evaluate the suitability of monitored natural attenuation as a remedy component in the northernmost area of the Regional Plume (Navy Site 8 North area, NASA-3A/ NASA-4A).



7 Factors Impacting the Remedy

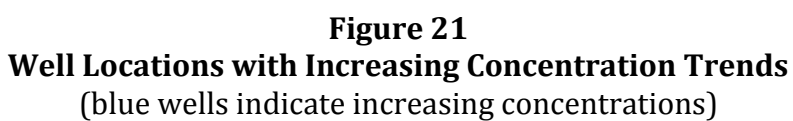
NASA has identified a number of issues that impact both the actual effectiveness of the remedy and the interpretation of remedy effectiveness. These issues include incomplete capture and hydraulic control of up-gradient sources, the co-mingling of petroleum hydrocarbon and VOC groundwater plumes, and a potential low-level source area near NASA-3A.

7.1 Up-Gradient Source Control

NASA reviewed existing data to evaluate the effectiveness of the up-gradient WATS and MEW extraction systems. Based upon different interpretations of estimated capture zones by the MEW, Navy and NASA, discrepancies between estimated groundwater capture efficiencies and observed field conditions, and lithologic logs and concentration-versus-time graphs of nearby wells, NASA concludes that contaminated groundwater containing both VOCs and fuels is by-passing these up-gradient extraction systems. This is also supported by statements contained in EPA's 5-Year Reviews (EPA, 2004 & 2009). The locations of the wells referenced below are shown on Figure 21.

Potential continuing up-gradient sources impacting groundwater quality in NASA's Area of Responsibility include:

1. Regional VOC Plume – Portions of the Regional Plume by-passing capture in the Northern WATS area (EPA, 2004 & 2009).
 - It appears that WATS and/or MEW extraction wells are not capturing the western margin of the Regional VOC plume. Concentrations of TCE and/or *cis*-1,2-DCE have increased in wells 14D09A, 14D13A, 14D28A, and 14E14A (Figures 22 through 25, respectively) since the startup of the WATS and RGRP extraction systems.
2. Building 88 (Former Navy Dry Cleaners) – PCE concentrations in groundwater are increasing in wells down-gradient of the Northern WATS area. Building 88 is a potential source of this contamination (EPA, 2004).
 - PCE concentrations have been increasing in well 14D36A (Figure 26).
3. Navy Site 9 – Petroleum hydrocarbons, especially gasoline, appear to be migrating from Site 9 and by-passing capture in the Northern WATS area.
 - NASA soil and groundwater investigations (ISSi, 2005 & 2006) down-gradient, up-gradient, and across the N211 Aircraft Ramp indicated the presence of elevated concentrations of jet fuel and gasoline migrating down-gradient of the Northern WATS area across the N211 Aircraft Ramp.



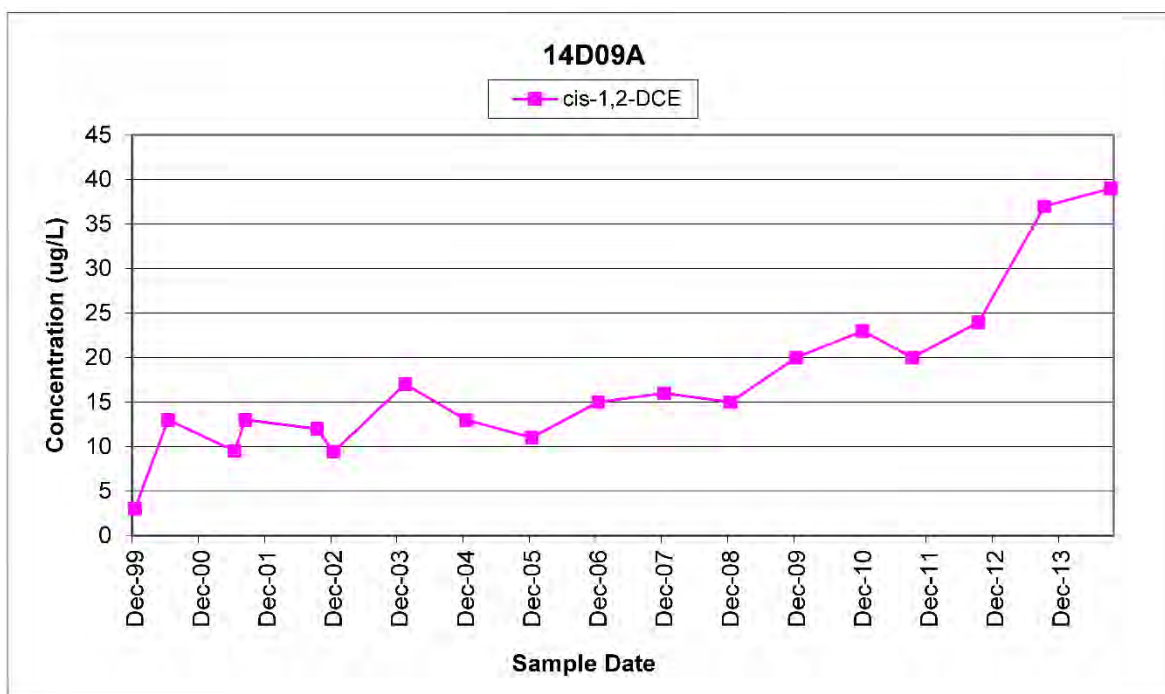


Figure 22
Cis-1,2-DCE Concentration-versus-Time Graph, Well 14D09A

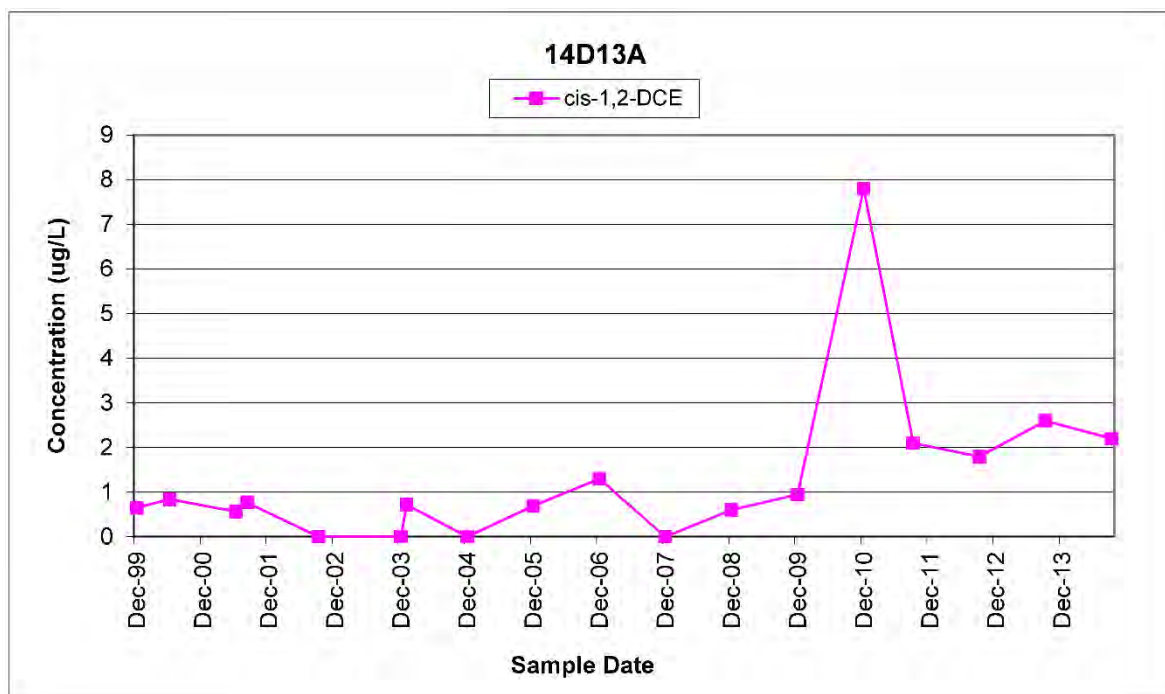


Figure 23
Cis-1,2-DCE Concentration-versus-Time Graph, Well 14D13A

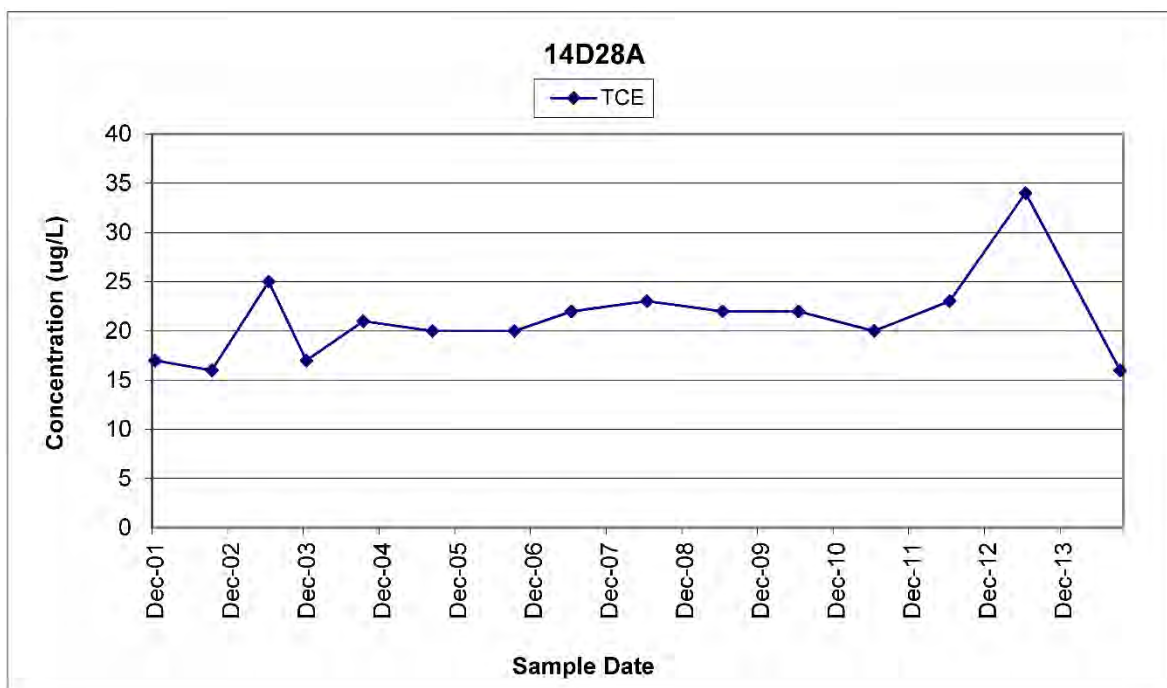


Figure 24
TCE Concentration-versus-Time Graph, Well 14D28A

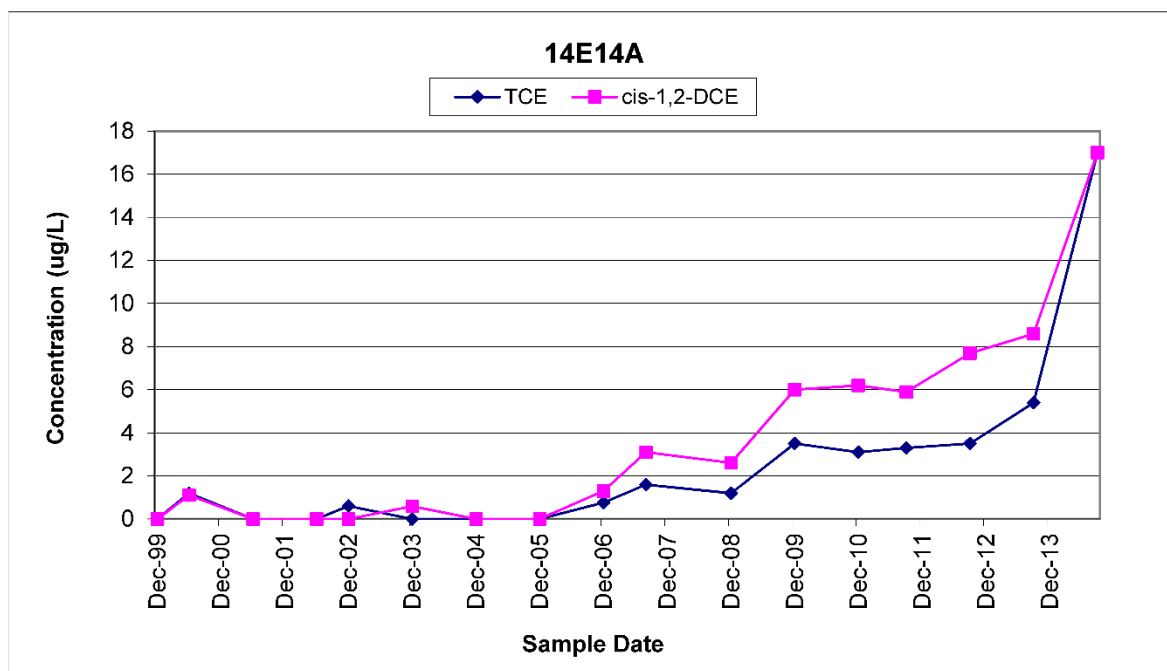


Figure 25
TCE and *cis*-1,2-DCE Concentration-versus-Time Graph, Well 14E14A

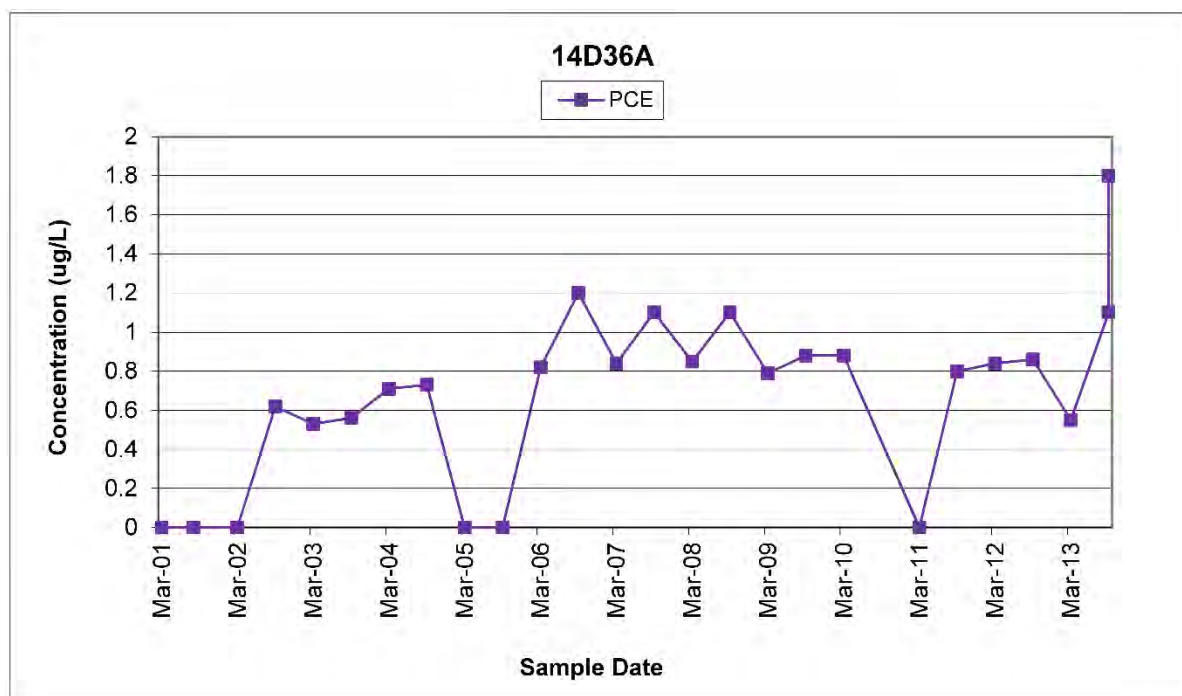


Figure 26
PCE Concentration-versus-Time Graphs, Well 14D36A



7.2 Co-Mingled VOC and Petroleum Plumes

The introduction of petroleum hydrocarbons into a chlorinated solvent groundwater plume provides a number of chemical and biological pathways for enhanced degradation. A number of petroleum hydrocarbon sources are present both up-gradient and within NASA's Area of Responsibility, including NASA's Areas of Investigation 1 and 3 and the Navy's Site 9.

The co-mingling of fuel and solvent plumes presents a number of challenges when interpreting chemical distribution maps. The enhanced degradation can lead to non-detectable concentrations of the more highly chlorinated solvents (e.g. TCE) resulting in "holes" or "gaps" in iso-concentration contour maps. Conversely, the resultant elevated concentrations of degradation chemicals, such as vinyl chloride, can appear as "bulls-eyes" or source areas. If these contouring features are not evaluated and addressed, a complete understanding of the hydrogeologic environment is not possible.

These mapping issues can become especially problematic when evaluating the performance of remedial systems. Declining TCE concentrations which are being attributed to successful hydraulic capture and containment may instead be caused by enhanced degradation by the fuel hydrocarbons. Conversely, increasing vinyl chloride concentrations, which are being produced by the enhanced degradation of TCE, may be attributed to failed hydraulic capture and containment.

To provide a more thorough evaluation of the extent of the Regional Plume, Figure 27 was created to present a summarized view of TCE, *cis*-1,2-DCE and vinyl chloride concentration contours in relation to historical petroleum hydrocarbon concentrations. As shown on the map, the TCE boundary along the eastern margin of the plume has been highly impacted by the presence of petroleum hydrocarbons. The vinyl chloride and *cis*-1,2-DCE contours extend beyond the TCE contour in this area, which is not observed in other areas of the plume.

Also significant, the vinyl chloride and petroleum plumes indicate a contaminant flow pathway that is not apparent by solely evaluating the TCE and *cis*-1,2-DCE boundaries. This illustrates the need to evaluate all of the contaminants of concern concurrently in order to gain a full understanding of plume distribution, groundwater and contaminant flow pathways, and remedial action effectiveness.





7.3 Additional Site 8 Source

During NASA's Quarter 3, 2012 sampling event, additional non-routine wells were sampled in order to better define the 5.0 µg/L TCE boundary near the leading edge of the plume. The detection of 49 µg/L of TCE in Navy well WSI-04A1, located approximately 300 feet west of NASA-3A, was incongruent with TCE concentrations in nearby wells. The TCE concentration in this well during the September, 2014 sampling was 58 µg/L.

The presence of 58 µg/L of TCE in Navy well WSI-04A1 cannot be explained based on the current knowledge of source areas within Navy Site 8 North and the current flow conditions in the area. Well WSI-04A1 is located approximately 150 feet cross-gradient of the previously excavated Site 8 North source area. Navy well W08-08A1, which also contains TCE concentrations higher than anticipated, is located approximately 450 feet in a mostly cross-gradient direction from the excavated source area. These outlying concentrations suggest that a potential low-level source of TCE is present up-gradient of well WSI-04A1.

In July, 2014, three CPT/Hydropunch locations (S8N-1, S8N-2, and S8N-3) were sampled in the vicinity of well WSI-04A1 during the Northernmost A2 Aquifer Assessment field work mobilization (Figure 29). The purpose of this reconnaissance sampling was to help identify any potential additional source areas up-gradient of well WSI-04A1 and to assist with lithologic mapping in the area. TCE concentrations from the three grab groundwater samples ranged from 5.8 µg/L to 41 µg/L. These results support the presence of a low-level source of TCE up-gradient of well WSI-04A1 and CPT location S8N-3. This low-level source is likely associated with releases from historic Navy drum storage within Navy Site 8.

In an effort to better explain the elevated concentration of TCE in well WSI-04A1, as well as down-gradient well W08-08A1, an alternative TCE plume map for the Navy Site 8 North area is presented in Figure 29. Figure 29 shows a redefined margin of the Regional Plume, along with a plume emanating from the residual contamination at the previously excavated Site 8 North source area (adjacent to well 11M21A). An estimation of a potential additional plume impacting wells WSI-04A1 and W08-08A1 is provided.

Since NASA-3A is located approximately 110 feet down-gradient and down-channel of the former Site 8 North spill area, NASA believes that NASA-3A is capturing the majority of contaminated groundwater flowing through this area. This is supported by flow budget calculations with respect to source area control. However, NASA extraction wells NASA-3A and NASA-4A were not intended to address either the larger Regional Plume mass migrating through this area or the smaller plume mass originating from the unidentified low-level source area. However, concentration trend analysis and plume mapping indicate that the plume boundaries are stable and the low hydraulic gradient limits potential down-gradient plume migration.

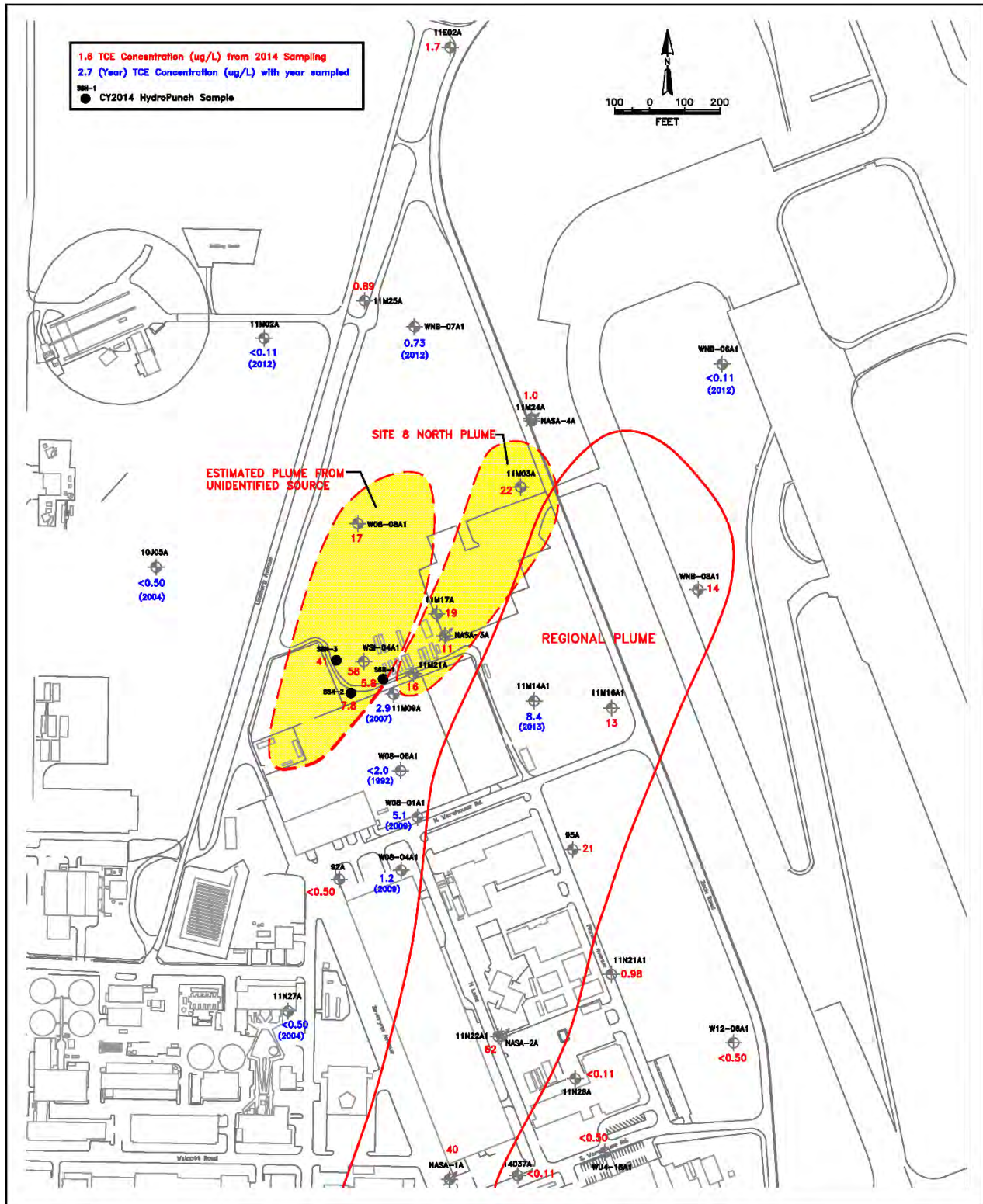


Figure 28
Site 8 North Alternative Plume Estimation



8 Conclusions

During CY2014, the NASA GWTS removed a total of 4.06 pounds of total VOCs from 8,335,505 gallons of groundwater. The NASA Ames GWTS was operational for 98.8% of CY2014. No significant problems related to the system operations were noted.

NASA-1A and NASA-3A are functioning as designed in that they are both providing adequate horizontal and vertical capture of their targeted treatment areas. While NASA-1A is also providing hydraulic containment of the Regional portion of the plume, NASA-3A is not.

- At NASA-1A, groundwater elevations, graphical flow net analysis, capture zone width calculations, and VOC concentration trends provide converging lines of evidence that the extraction well is achieving adequate horizontal and vertical capture and hydraulic containment of the suspected source area and hydraulic containment of the Regional Plume.
- At NASA-3A, capture zone width calculations and VOC concentration trends indicate that the extraction well is achieving adequate horizontal and vertical capture of the Navy Site 8 North source area. However, groundwater elevations, graphical flow net analysis, capture zone width calculations, and VOC concentration trends indicate that the Regional portion of the plume and the low-level plume originating from an unknown low-level source area are not being fully captured or hydraulically contained. This low-level source is likely associated with releases from historic Navy drum storage within Navy Site 8. However, the incomplete hydraulic containment in this area is not critical because concentration trend analysis and plume mapping indicate that the plume boundaries are stable and the low hydraulic gradient limits potential down-gradient plume migration. The increased pumping rate at NASA-3A will provide an incremental increase in capture and hydraulic containment of the Regional portion of the plume.
- Mann-Kendall trend analysis indicates that TCE concentrations are decreasing or stable in 94% of NASA's RGRP wells. Approximately 28% of the wells display decreasing TCE concentrations and 67% are stable. *Cis*-1,2-DCE concentrations are decreasing or stable in 83% of NASA's RGRP wells. Approximately 44% of the wells display decreasing *cis*-1,2-DCE concentrations and 39% are stable.



NASA has identified a number of issues that impact both the actual effectiveness of the remedy and the interpretation of remedy effectiveness. These issues include:

- The uncertainty of the extent of plume capture near REG-6A, REG-7A and EA1-4 and increasing levels of PCE, TCE and/or *cis*-1,2-DCE in down-gradient wells.
- The uncertainty of the extent of plume capture near REG-6A, EA1-4 and EA1-5 allowing the down-gradient migration of petroleum hydrocarbons.
- The co-mingling of petroleum hydrocarbon and VOC groundwater plumes interfering with accurate plume boundary mapping and capture zone effectiveness evaluations.
- The presence of a localized area just west of NASA-3A that contains VOCs at higher levels than those associated with the Regional Plume in that area. This localized area is not being directly captured by NASA-3A.
- In addition to effective source control, NASA-1A also addresses the Regional Plume in the southern area. However, NASA-3A does not provide complete capture of the Regional Plume in the northernmost area of the Regional Plume.



9 Recommendations

Based on the remedy assessment provided in this Annual Progress Report, as well as previous recommendations provided by the EPA in their 5-Year Reviews and other documents, NASA provides the following recommendations.

9.1 Complete New A2/B1-Aquifer Plume Definition Assessment

As described in Section 3.2, NASA anticipates that the proposed additional investigation will be conducted during CY2015.

9.2 Existing Network Optimization

During the recent NPDES discharge permit renewal for NASA's treated groundwater discharge, NASA requested an increased permitted discharge limit of 20 gpm. The increased discharge limit was approved by the RWQCB and the pumping rate of extraction well NASA-3A was increased to 8 gpm in October, 2014. The increased pumping rate has enlarged the capture zone of NASA-3A and allowed for an incremental increase in mass removal and hydraulic containment. NASA will continue to operate NASA-3A at the increased pumping rate during CY2015 and will continue to evaluate the impact of the increased pumping rate on capture zone propagation.

9.3 Groundwater Sampling Program Modifications

Prior to 2014, NASA sampled 13 wells for the RGRP monitoring program on a semi-annual basis in March and September. During the September sampling event, NASA also sampled five RGRP wells on behalf of the Parties. In June of each year, NASA voluntarily sampled seven non-RGRP wells to obtain additional data within and up-gradient of NASA's Area of Responsibility. NASA's two operating extraction wells were sampled quarterly.

Because the data collected by NASA during the March and June sampling events was not used by the RGRP for mapping and reporting purposes, NASA switched to annual sampling in 2014 to align with the RGRP annual sampling event. On September 3, 2014, NASA submitted a letter to the EPA proposing a modification to NASA's monitoring well network (NASA, 2014). The proposed network included selected wells from NASA's 13 RGRP wells, five RGRP wells, seven voluntary wells, and additional wells at locations important for remedy evaluation. The EPA responded in a September 24, 2014 e-mail that additional information was required before the modified well network could be approved. Therefore, during the September 2014 annual sampling event, NASA sampled the standard well network, in addition to the additional wells proposed for the modified network.



Prior to the CY2015 annual sampling event, NASA will provide the EPA with the previously requested information regarding the proposed modified monitoring well network. The requested changes would increase the number of wells that are sampled by NASA for the annual RGRP groundwater sampling events from 20 wells to 26 wells.

In addition, to align with the RGRP groundwater sampling methodology, NASA will be changing from the three well-volume purge method to the no-purge HydraSleeve method. During the September 2014 sampling event, NASA sampled a number of wells using both methods to provide data for comparative analysis to verify that the HydraSleeve method is suitable for the groundwater conditions present at NASA. The results will be provided to the EPA for approval of the change in sampling methodology.

9.4 Monitored Natural Attenuation near Navy Site 8 North

The hydrogeologic conditions and contaminant levels in the northernmost area of the plume near Navy Site 8 North create challenges to developing and applying a remedy that is expedient and cost efficient. Some of the challenging conditions include:

- Large lateral extent of the combined Regional and Navy Site 8 North plume.
- Presence of relatively thick, high permeability sand and gravels.
- Relatively low VOC concentrations (maximum TCE concentration of 58 µg/L)

The combined effects of these conditions for the current remedy require the extraction, treatment and discharge of a large volume of groundwater to produce a marginal improvement in groundwater quality.

Based on these challenges, NASA will evaluate the suitability of applying monitored natural attenuation (MNA) as a remedy component in the Navy Site 8 North area (NASA-3A/NASA-4A). NASA believes that MNA should be evaluated as a viable remedy component because of the observed plume stability and the limited potential of plume migration due to the low hydraulic gradient. Based upon the outcome of the suitability evaluation, NASA will prepare a Work Plan to address additional data needs related to geochemistry, plume definition, and geologic characterization.



10 Upcoming CY2015 Work and Planned Future Activities

NASA plans the following tasks for CY2015/2016:

- Monthly GWTS NPDES influent and effluent sampling.
- Quarterly GWTS NPDES reporting in April, July, October 2015 and January 2016.
- Annual GWTS NPDES reporting in January 2016.
- Annual groundwater sampling in September 2015.
- Semi-annual site-wide groundwater level measurements in March and September 2015.
- Complete A2/B1 aquifer groundwater investigation as specified in the *Draft Amendment to Final Work Plan for the Northernmost A2/B1-Aquifer Plume Definition Assessment* (ERT, 2015).
- Complete suitability evaluation for monitored natural attenuation for the northernmost plume area (Navy Site 8 North) and submit implementation Work Plan.



11 References

EKI, 1992. *Listing Site Inspection for NASA Ames Research Center, Moffett Field, California.*

EKI, 1994a. *Center-Wide Sampling and Analysis Program, Program Overview, NASA Ames Research Center, Moffett Field, California.*

EKI, 1994b. *Center-Wide Sampling and Analysis Program, Volume VII: Work Plan for Area of Investigation 7, NASA Ames Research Center, Moffett Field, CA.*

EKI, 1995. *Proposed Locations of NASA Ames Groundwater Extraction Wells in the VTOL Pad and South Navy Warehouse Areas, NASA Ames Research Center, Moffett Field, California.*

EPA, 1989. *Record of Decision, Fairchild, Intel, and Raytheon Sites, Middlefield/Ellis/ Whisman (MEW) Study Area, Mountain View, California.*

EPA, 2004. *Final First Five-Year Review Report for Middlefield-Ellis-Whisman (MEW) Superfund Study Area, Mountain View, California.*

EPA, 2009. *Final Second First Five-Year Review Report for Middlefield-Ellis-Whisman (MEW) Superfund Study Area, Mountain View, California.*

ERT, 2014. *Draft Work Plan for the Northernmost A2/B1-Aquifer Plume Definition Assessment.*

ERT, 2015a. *2014 Annual NPDES Self-Monitoring Report for the NASA Ames RGRP GWTS.*

ERT, 2015b. *Draft Amendment to Final Work Plan for the Northernmost A2/B1-Aquifer Plume Definition Assessment.*

Geosyntec, 2013. *Final Grab-Groundwater Assessment and Proposed Well Installations.*

ISSi, 2005. *Final, Area of Investigation 3 East, Up-Gradient Source Investigation, Soil and Groundwater Sampling and Analysis Report of Findings, August 2005.*

ISSi, 2006. *Draft Report of Findings, N211 Aircraft Ramp/Northern West-Side Aquifer Treatment System Area, Soil and Groundwater Investigation.*

NASA, 1994. *Site 8-North Soil Excavation & Source Removal, NASA Ames Research Center.*

NASA, 1998. *Allocation and Settlement Agreement for MEW Remedial Program Management between the National Aeronautics and Space Administration and Fairchild Semiconductor Corporation, Raytheon Company, and Intel Corporation.*

NASA, 2014. September 3, 2014 letter to EPA requesting modification to NASA's groundwater monitoring network.



PRC, 1997. *West-Side Aquifer Treatment System, Long-Term Groundwater Monitoring Plan.*

Smith Environmental, 1996. *Revised Final Design, Regional Ground Water Remediation Program, North of U.S. Highway 101, Middlefield-Ellis-Whisman Site, Mountain View, California.*

TTEMI, 2008. *Draft Boundary Treatment Zone Air Sparge Barrier, Operation and Maintenance Plan.*



APPENDIX A

CY2014 NPDES Self-Monitoring Report



February 12, 2015

Reply to Attn of: JQ: 204-15

Ms. Lourdes Gonzales
Regional Water Quality Control Board
NPDES Division
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

SUBJECT: NASA Ames Research Center, CIWQS Place ID: 243875 (lrg)
2014 Annual Self-Monitoring Report
NPDES Permit No. CAG912002 (VOC and Fuel General Permit)

Dear Ms. Gonzales:

Enclosed please find the referenced report for discharge of treated groundwater from NASA Ames Research Center's groundwater treatment system. The system was in compliance with all provisions of the permit during this reporting period.

I certify under penalty of law that this document and attachments are prepared under my direction or supervision in accordance with a system designed to ensure qualified personnel gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing the violations.

Please contact me at 650-604-1254 or kimberly.s.finch@nasa.gov with any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "K Finch".

Kimberly Finch, P.E.
Restoration Program Manager
Environmental Management Division

Enclosure

cc: (electronically)
Joyce Adams, Weiss Associates
Scott Anderson, US Navy
Bill Berry, Moffett RAB
Henry Chui, DTSC
Yvonne Fong, USEPA
John Gallinatti, Geosyntec Consultants
Elie Haddad, Haley & Aldrich
Jennifer Ledesma, CH2M Hill
Alana Lee, USEPA
Grace Ma, USEPA
Lenny Siegel, CPEO
Maile Smith, Northgate Environmental Management
Pete Strauss, PM Strauss and Associates
Elizabeth Wells, RWQCB
237-15\D. Chuck
T20G-4\B. Reddig
File
Chron



2014 Annual Self-Monitoring Report

NASA Ames Groundwater Treatment System

Regional Groundwater Remediation Program

**Order No. R2-2012-0012
NPDES Permit Number CAG912002**

Prepared for:

NASA Ames Research Center
Environmental Management Division
Code JQ
Moffett Field, CA

Prepared by:



Earth Resources Technology, Inc.
NASA Ames Research Center
Moffett Field, California 94035-1000

February 2015



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List of Acronyms & Abbreviations

°C	degrees Celsius
<	less than
mg/L	milligrams per liter
µg/L	micrograms per liter
µS/cm	micro Siemens per centimeter
As	arsenic
Ag	silver
Be	beryllium
BTEX	benzene, toluene, ethylbenzene and xylenes
CaCO ₃	calcium carbonate
Cd	cadmium
CIWQS	California Integrated Water Quality System
Cr	chromium
Cu	copper
CY	calendar year
DCA	dichloroethane
DCE	dichloroethene
DEHP	Bis(2-ethylhexyl)phthalate
DNOP	Di-n-octyl phthalate
ERT	Earth Resources Technology
Freon 11	trichlorofluoromethane
Freon 113	1,1,2-trichloro-1,2,2-trifluoroethane
GAC	granular activated carbon
gpd	gallons per day
gpm	gallons per minute
GWTS	Groundwater Treatment System
Hg	mercury
MTBE	methyl tert-butyl ether
NASA	National Aeronautics and Space Administration
ND	not detected
Ni	nickel
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
Pb	lead
pH	potential Hydrogen
RGRP	Regional Groundwater Remediation Program
RWQCB	Regional Water Quality Control Board
Sb	antimony
Se	selenium
SVOCs	semi-volatile organic compounds
TCE	trichloroethene
Tl	thallium
TPH-D	total petroleum hydrocarbons as diesel
TPH-G	total petroleum hydrocarbons as gasoline
TPH-JP4	total petroleum hydrocarbons as JP4 jet fuel
TPH-JP5/8	total petroleum hydrocarbons as JP5 and JP8 jet fuel
TPH-MO	total petroleum hydrocarbons as motor oil
VOCs	volatile organic compounds
Zn	zinc



1 Introduction

On behalf of the National Aeronautics and Space Administration (NASA) Ames Research Center (NASA Ames), Earth Resources Technology, Inc. (ERT) has prepared this 2014 Annual Self-Monitoring Report for the NASA Ames Groundwater Treatment System (GWTS) located at the corner of North Warehouse Road and H Lane at Moffett Field, California (Figure 1). This Report was prepared in accordance with the Self-Monitoring Program reporting requirements contained in the National Pollutant Discharge Elimination System (NPDES) Permit Number CAG912002 (VOC and Fuel General Permit, Order R2-2012-0012, CIWQS Place Identification 243875), issued by the California Regional Water Quality Control Board (RWQCB) to NASA on August 25, 2014. This Report details the results of water quality analyses and operational data obtained from the NASA Ames GWTS during the calendar year (CY) 2014.



2 Background

Groundwater extracted from extraction wells NASA-1A and NASA-3A is pre-filtered by two 25-micron bag filters operating in parallel, prior to passing through two 5,000-pound granular activated carbon (GAC) vessels operating in series. Treated groundwater is then discharged to Stevens Creek in accordance with the NPDES permit. Figure 1 shows the locations of the treatment system outfall and discharge route to Stevens Creek. Figure 2 details the treatment process and influent and effluent sample points. The construction of the NASA GWTS was completed in August 2001 and operation began on September 10, 2001. Groundwater extraction from wells NASA-2A and NASA-4A was suspended on April 18, 2009.

On August 25, 2014, NASA was authorized by the California Regional Water Quality Control Board (RWQCB) to discharge its treated groundwater under the VOC and Fuel General Permit (Permit Number CAG912002, Order R2-2012-0012). Beginning with the September 2014 sampling event, NASA initiated the sampling and reporting requirements in accordance with the provisions on the new NPDES permit. In addition, the RWQCB approved NASA's request to increase its maximum discharge flow rate from 15 gallons per minute (gpm) to 20 gpm.



3 System Operational Status, Calendar Year 2014

3.1 System-Wide Shutdowns

During CY2014, the NASA GWTS experienced several manual and automatic shutdowns. The automatic shutdowns resulted from problems with sensor faults. The manual shutdowns were associated with maintenance activities being performed on the RGRP system. The dates and durations of these shutdowns are detailed in Table 1.

The NASA GWTS was operational for 98.8 % of CY2014. During CY2014, the GWTS was fully operational (both extraction wells operating) for 98.0% of the year and was partially operational (only one extraction well operating) for 0.7% of the year. The GWTS was not operating for 1.2% of CY2014.

Table 1
CY2014 NASA GWTS Operational Shut-Downs

Date(s)	Duration (hours)	Cause
5/20/2014	2	Faulty treatment pad alarm
7/17/2014 – 7/18/2014	12	Leak detection vault alarm (condensation)
9/8/2014	5	Maintenance on RGRP system
10/11/2014 – 10/14/2014	59	Maintenance on RGRP system
11/17/14	6	Maintenance on RGRP system
12/11/2014 – 12/12/2014	24	Extreme rainfall-induced system alarms
12/29/14 – 12/31/14	65	Water-level sensor malfunction (NASA-3A only)



3.2 Granular Activated Carbon Replacements

On May 15, 2014, the GAC within vessel GAC-552 was replaced. Vessel GAC-552 served as the secondary GAC vessel from November 16, 2012 to October 29, 2013 (11 months of service) and served as the primary GAC vessel from October 29, 2013 to May 15, 2014 (7 months of service). No system shutdown was required during the carbon replacement and associated system maintenance activities.

On December 23, 2014, the GAC within vessel GAC-551 was replaced. Vessel GAC-551 served as the secondary GAC vessel from October 29, 2013 to May 15, 2014 (7 months of service) and served as the primary GAC vessel from May 15, 2014 to December 23, 2014 (7 months of service). No system shutdown was required during the carbon replacement and associated system maintenance activities.

3.3 VOC Mass Removal

During CY2014, the NASA Ames GWTS removed a total of 4.06 pounds of Volatile Organic Compounds (VOCs) from 8,335,505 gallons of groundwater. Table 2 summarizes the volume of groundwater and VOC mass removal for the NASA GWTS.



Table 2
CY 2014 Flow and Mass Removal Data

Month	Total System Influent (gallons)	Average Flow (gpd)	Average Flow (gpm)	Influent VOC Concentration (µg/L)	Total VOC Mass Removed (pounds)
January	670,573	21,631	15.02	54.58	0.31
February	605,185	21,614	15.01	49.50	0.25
March	669,260	21,589	14.99	58.20	0.33
April	647,834	21,594	15.00	71.72	0.39
May	669,050	21,582	14.99	30.58	0.17
June	647,737	21,591	14.99	77.64	0.42
July	669,460	21,595	15.00	59.39	0.33
August	669,341	21,592	14.99	33.20	0.19
September	749,337	24,978	17.35	55.40	0.35
October	796,801	25,703	17.85	62.33	0.41
November	835,048	27,835	19.33	64.73	0.45
December	705,879	22,770	15.81	77.63	0.46
Monthly Average	694,625	22,840	15.86	57.91	0.34
Yearly Sum	8,335,505	---	---	---	4.06

gpd = gallons per day
gpm = gallons per minute
VOC = volatile organic compounds
µg/L = micrograms per liter



4 Water Quality Analysis

The results of the CY2014 analytical testing and standard observations are summarized in the tables as follows:

- Table 3 – Volatile Organic Compounds
- Table 4 – Petroleum Hydrocarbons & Fuel-Related Compounds
- Table 5 – Semi-Volatile Organic Compounds, Cyanide & Turbidity
- Table 6 – Priority Pollutant Metals
- Table 7 – Fish Bioassay
- Table 8 - Temperature and pH
- Table 9 – Standard Observations

Laboratory-certified analytical reports were provided in the previously submitted Quarterly Self-Monitoring Reports. The influent and effluent sample points are shown in Figure 2.



Table 3
First Quarter 2014 NASA Ames GWTS
Analytical Results - Volatile Organic Compounds

Sample Location	Sample Date	1,1-DCA (µg/L)	1,1-DCE (µg/L)	cis-1,2-DCE (µg/L)	TCE (µg/L)	Other VOCs (µg/L)
NASA-I	1/22/14	2.8	6.0	19	24	1,1,1-TCA = 0.38 ^J trans-1,2-DCE = 0.64 ^J Freon 113 = 1.2 ^J Vinyl Chloride = 0.56
NASA-E	1/22/14	ND	ND	ND	ND	ND
NASA-I	2/25/14	2.2	4.0	17	25	Freon 113 = 1.3 ^J
NASA-E	2/25/14	ND	ND	0.69	ND	ND
NASA-I	3/25/14	4.1	4.5	19	27	chloromethane = 0.88 ^J Freon 11 = 0.44 ^J Freon 113 = 1.7 ^J Vinyl Chloride = 0.58
NASA-E	3/25/14	ND	ND	ND	ND	ND

NASA-I = Influent

NASA-E = Effluent

ND = Not Detected above applicable Laboratory Detection Limits

µg/L = micrograms per liter

DCA = Dichloroethane

DCE = Dichloroethene

TCA = Trichloroethane

TCE = Trichloroethene

Freon 11 = Trichlorofluoromethane

Freon 113 = 1,1,2-trichloro-1,2,2-trifluoroethane

VOCs = Volatile Organic Compounds

^J = detected, but below the Report Limit; therefore, result is an estimated concentration



Table 3 (continued)
Second Quarter 2014 NASA Ames GWTS
Analytical Results – Volatile Organic Compounds

Sample Location	Sample Date	1,1-DCA (µg/L)	1,1-DCE (µg/L)	cis-1,2-DCE (µg/L)	TCE (µg/L)	Other VOCs (µg/L)
NASA-I	4/22/14	3.9	6.0	25	34	trans-1,2-DCE = 0.66 ^J Freon 11 = 0.57 ^J Freon 113 = 0.67 ^J Vinyl Chloride = 0.92
NASA-E	4/22/14	ND	ND	ND	ND	ND
NASA-I	5/28/14	1.4	2.8	9.9	14	trans-1,2-DCE = 0.29 ^J Freon 113 = 1.7 ^J Vinyl Chloride = 0.49 ^J
NASA-E	5/28/14	ND	ND	ND	ND	Methylene Chloride = 0.64 ^J
NASA-I	6/24/14	4.0	6.5	28	36	Freon 11 = 0.45 ^J Freon 113 = 1.9 ^J Vinyl Chloride = 0.79
NASA-E	6/24/14	ND	ND	ND	ND	ND

NASA-I = Influent

NASA-E = Effluent

ND = Not Detected above applicable Laboratory Detection Limits

µg/L = micrograms per liter

DCA = Dichloroethane

DCE = Dichloroethene

TCA = Trichloroethane

TCE = Trichloroethene

Freon 11 = Trichlorofluoromethane

Freon 113 = 1,1,2-trichloro-1,2,2-trifluoroethane

VOCs = Volatile Organic Compounds

^J = detected, but below the Report Limit; therefore, result is an estimated concentration



Table 3 (continued)
Third Quarter 2014 NASA Ames GWTS
Analytical Results – Volatile Organic Compounds

Sample Location	Sample Date	1,1-DCA (µg/L)	1,1-DCE (µg/L)	cis-1,2-DCE (µg/L)	TCE (µg/L)	Other VOCs (µg/L)
NASA-I	7/23/14	3.4	6.8	20	26	<i>trans</i> -1,2-DCE = 0.53 ^J Freon 113 = 2.0 ^J Vinyl Chloride = 0.66
NASA-E	7/23/14	ND	ND	ND	ND	ND
NASA-I	8/26/14	1.7	3.4	11	15	Freon 113 = 2.1 ^J
NASA-E	8/26/14	ND	ND	ND	ND	ND
NASA-I	9/23/14	2.4	6.5	19	25	Freon 11 = 0.42 ^J Freon 113 = 1.4 ^J Vinyl Chloride = 0.68
NASA-E	9/23/14	ND	ND	ND	ND	ND

NASA-I = Influent

NASA-E = Effluent

ND = Not Detected above applicable Laboratory Detection Limits

µg/L = micrograms per liter

DCA = Dichloroethane

DCE = Dichloroethene

TCE = Trichloroethene

Freon 11 = Trichlorofluoromethane

Freon 113 = 1,1,2-trichloro-1,2,2-trifluoroethane

VOCs = Volatile Organic Compounds

^J = detected, but below the Report Limit; therefore, result is an estimated concentration



Table 3 (continued)
Fourth Quarter 2014 NASA Ames GWTS
Analytical Results – Volatile Organic Compounds

Sample Location	Sample Date	1,1-DCA (µg/L)	1,1-DCE (µg/L)	cis-1,2-DCE (µg/L)	TCE (µg/L)	Other VOCs (µg/L)
NASA-I	10/22/14	3.8	5.0	21	29	<i>trans</i> -1,2-DCE = 0.62 ^J Freon 11 = 0.40 ^J Freon 113 = 1.6 ^J Vinyl Chloride = 0.91
NASA-E	10/22/14	ND	ND	ND	ND	ND
NASA-I	11/18/14	3.3	5.9	21	32	<i>trans</i> -1,2-DCE = 0.48 ^J Freon 113 = 1.5 ^J Vinyl Chloride = 0.55
NASA-E	11/18/14	ND	ND	ND	ND	ND
NASA-I	12/9/14	3.5	6.6	26	39	<i>trans</i> -1,2-DCE = 0.63 ^J Freon 113 = 1.9 ^J
NASA-E	12/9/14	ND	ND	ND	ND	ND

NASA-I = Influent

NASA-E = Effluent

ND = Not Detected above applicable Laboratory Detection Limits

µg/L = micrograms per liter

DCA = Dichloroethane

DCE= Dichloroethene

TCE = Trichloroethene

Freon 11 = Trichlorofluoromethane

Freon 113 = 1,1,2-trichloro-1,2,2-trifluoroethane

VOCs = Volatile Organic Compounds

^J = detected, but below the Report Limit; therefore, result is an estimated concentration



Table 4
CY2014 NASA Ames GWTS
Analytical Results - Petroleum Hydrocarbons and Fuel-Related Compounds

Sample Location	Sample Date	Total Petroleum Hydrocarbons (µg/L)	BTEX (µg/L)	MTBE (µg/L)	Fuel Oxygenates (µg/L)
NASA-I	1/22/14	TPH-G = 19 ^J	ND	<0.030	---
NASA-E	1/22/14	ND	ND	<0.030	---
NASA-I	2/25/14	TPH-G = 19 ^J	ND	<0.030	---
NASA-E	2/25/14	ND	ND	<0.030	---
NASA-I	3/25/14	TPH-G = 19 ^J	ND	1.7 ^J	---
NASA-E	3/25/14	ND	ND	<0.030	---
NASA-I	4/22/14	TPH-G = 19 ^J	ND	<0.030	---
NASA-E	4/22/14	ND	ND	<0.030	---
NASA-I	5/28/14	TPH-G = 21 ^J	ND	<0.030	---
NASA-E	5/28/14	ND	ND	<0.030	---
NASA-I	6/24/14	TPH-G = 54	ND	<0.030	DIPE = 0.98 ^J
NASA-E	6/24/14	TPH-G = 35 ^J	ND	<0.030	ND
NASA-I	7/23/14	TPH-G = 26 ^J TPH-MO = 270	ND	<0.030	---
NASA-E	7/23/14	TPH-MO = 840	ND	<0.030	---
NASA-I	8/26/14	TPH-G = 42 ^J	ND	<0.030	---
NASA-E	8/26/14	TPH-G = 28 ^J	ND	<0.030	---
NASA-I	9/23/14	TPH-G = 43 ^J	ND	<0.030	---
NASA-E	9/23/14	TPH-G = 32 ^J	ND	<0.030	---
NASA-I	10/22/14	TPH-G = 37 ^J	ND	<0.030	---
NASA-E	10/22/14	TPH-G = 29 ^J	ND	<0.030	---
NASA-I	11/18/14	TPH-G = 21 ^J	ND	<0.030	---
NASA-E	11/18/14	ND	ND	<0.030	---
NASA-I	12/9/14	ND	ND	ND	---
NASA-E	12/9/14	TPH-G = 22 ^J	ND	ND	---

NASA-I = Influent

NASA-E = Effluent

ND = Not Detected

-- = Analysis/analyses not required

Total Petroleum Hydrocarbons includes motor oil, diesel, JP4/5/8, and gasoline

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

MTBE = Methyl Tertiary Butyl Ether

DIPE = Di-isopropyl Ether

^J = detected, but below the Report Limit; therefore, result is an estimated concentration



Table 5
CY2014 NASA Ames GWTS
Analytical Results – SVOCs, Cyanide & Turbidity

Sample Location	Sample Date	SVOCs (µg/L)	1,4-Dioxane (µg/L)	Cyanide (µg/L)	Turbidity (NTU)
NASA-I	3/25/14	ND	<0.50	---	---
NASA-E	3/25/14	ND	<0.50	---	---
NASA-I	9/23/14	DEHP = 1.2 [‡] DNOP = 2.8 [‡]	<0.50	---	---
NASA-E	9/23/14	DEHP = 0.74 [‡] DNOP = 1.9 [‡]	<0.50	---	---
NASA-I	10/22/14	---	---	---	---
NASA-E	10/22/14	DEHP = 0.86 [‡] DNOP = 1.2 [‡]	---	---	---
NASA-I	11/18/14	---	---	---	---
NASA-E	11/18/14	ND	---	---	---
NASA-I	12/9/14	ND	---	---	---
NASE-E	12/9/14	ND	---	<1.2	0.15

NASA-I = Influent

NASA-E = Effluent

SVOCs = Semi-Volatile Organic Compounds

µg/L = micrograms per liter

DEHP = Bis(2-ethylhexyl)phthalate

DNOP = Di-n-octyl phthalate

ND = Not Detected

NTU = Nephelometric Turbidity Units

[‡] = detected, but below the Report Limit; therefore, result is an estimated concentration

--- = Not Analyzed



Table 6
CY2014 NASA Ames GWTS
Analytical Results – Priority Pollutant Metals

Sample Location	Sample Date	As (µg/L)	Cr (µg/L)	Cu (µg/L)	Ni (µg/L)	Tl (µg/L)	Ag, Be, Cd, Hg, Pb, Sb, Se, Zn (µg/L)
NASA-E	12/9/14	1.3	0.33 ^J	0.36 ^J	0.75 ^J	0.34 ^J	ND
Trigger Level		10	11	4.7	19	1.7	varies

NASA-E = Effluent

µg/L = micrograms per liter

^J = detected, but below the Report Limit; therefore, result is an estimated concentration

As = arsenic, Cr = chromium, Cu = copper, Ni = nickel, Tl = thallium, Ag = silver, Be = beryllium,

Cd = cadmium, Hg = mercury, Pb = lead, Sb = antimony, Se = selenium, Zn = zinc

Table 7
CY2014 NASA Ames GWTS
Analytical Results – Fish Bioassay

96 hr. Static Renewal Fish Bioassay (Rainbow Trout)		
NASA-E-120914 (12/9/2014)		
Parameter	Result A	Result B
96-Hour % Survival	100%	100%
Dissolved Oxygen	8.69 mg/L	8.75 mg/L
pH	7.85 standard units	7.83 standard units
Conductivity	398.1 µS/cm	607.4 µS/cm
Temperature	12.0° C	12.0° C
Alkalinity	463.78 mg/L as CaCO ₃	471.92 mg/L as CaCO ₃
Hardness	574 mg/L as CaCO ₃	584 mg/L as CaCO ₃

NASA-E = Effluent

mg/L = milligrams per liter

µS/cm = micro Siemens per centimeter

°C = degrees Celsius

CaCO₃ = calcium carbonate



Table 8
CY2014 NASA Ames GWTS
Monitoring Data - Temperature and pH

Sample Location	Sample Date	Temperature (°C)	pH (Standard Units)
NASA-I	1/22/14	17.6	7.36
NASA-E	1/22/14	15.8	7.27
NASA-I	2/25/14	17.8	7.39
NASA-E	2/25/14	16.5	7.35
NASA-I	3/25/14	17.9	7.34
NASA-E	3/25/14	15.5	7.29
NASA-I	4/22/14	17.2	7.31
NASA-E	4/22/14	15.9	7.22
NASA-I	5/28/14	18.5	7.32
NASA-E	5/28/14	18.1	7.29
NASA-I	6/24/14	19.3	7.30
NASA-E	6/24/14	19.5	7.27
NASA-I	7/23/14	19.7	7.31
NASA-E	7/23/14	20.4	7.27
NASA-I	8/26/14	20.7	7.28
NASA-E	8/26/14	22.5	7.24
NASA-I	9/23/14	20.2	7.21
NASA-E	9/23/14	20.2	7.30
NASA-I	10/22/14	19.8	7.28
NASA-E	10/22/14	19.5	7.27
NASA-I	11/18/14	19.2	7.26
NASA-E	11/18/14	17.9	7.27
NASA-I	12/9/14	19.7	7.33
NASA-E	12/9/14	18.6	7.28

NASA-I = Influent
 NASA-E = Effluent
 °C = degrees Celsius



Table 9
CY2014 NASA Ames GWTS
Monitoring Data - Standard Observations

Sample Location	Sample Date	Floating/ Suspended Material	Deposits, Discoloration and/or Plugging	Prevention of Overflow or Bypass	Odor
NASA-I	1/22/14	--	--	--	No
NASA-E	1/22/14	No	No	OK	No
NASA-I	2/25/14	--	--	--	No
NASA-E	2/25/14	No	No	OK	No
NASA-I	3/25/14	--	--	--	No
NASA-E	3/24/14	No	No	OK	No
NASA-I	4/22/14	--	--	--	No
NASA-E	4/22/14	No	No	OK	No
NASA-I	5/28/14	--	--	--	No
NASA-E	5/28/14	No	No	OK	No
NASA-I	6/24/14	--	--	--	No
NASA-E	6/24/14	No	No	OK	No
NASA-I	7/23/14	--	--	--	No
NASA-E	7/23/14	No	No	OK	No
NASA-I	8/26/14	--	--	--	No
NASA-E	8/26/14	No	No	OK	No
NASA-I	9/23/14	--	--	--	No
NASA-E	9/23/14	No	No	OK	No
NASA-I	10/22/14	--	--	--	No
NASA-E	10/22/14	No	No	OK	No
NASA-I	11/18/14	--	--	--	No
NASA-E	11/18/14	No	No	OK	No
NASA-I	12/9/14	--	--	--	No
NASA-E	12/9/14	No	No	OK	No

NASA-I = Influent

NASA-E = Effluent

-- = Observation not required



5 Discussion

5.1 *Cis*-1,2-DCE Detection in February Effluent Sample

On the February 25, 2014 sampling event, *cis*-1,2-DCE was detected at a concentration of 0.69 µg/L in the effluent sample. *Cis*-1,2-DCE was detected in the influent sample at a concentration of 17 µg/L. *Cis*-1,2-DCE was not detected in the sample collected between the two GAC units. The effluent limitation for *cis*-1,2-DCE is 5.0 µg/L. No further action is required at this time.

5.2 Methylene Chloride Detection in May Effluent Sample

On the May 28, 2014 sampling event, methylene chloride was detected at a concentration of 0.64 µg/L in the effluent sample. Methylene chloride was not detected in the influent sample or the sample collected between the two GAC units. The effluent limitation for methylene chloride is 5.0 µg/L. No further action is required at this time.

5.3 TPH-Gasoline Detection in June Effluent Sample

On the June 24, 2014 sampling event, TPH-gasoline was detected at a concentration of 35 µg/L in the effluent sample. TPH-gasoline was detected in the influent sample at a concentration of 54 µg/L. The effluent trigger level for TPH-gasoline is 50 µg/L. No further action is required at this time.

5.4 TPH-Motor Oil Trigger Level Exceedance in July Effluent

On the July 23, 2014 sampling event, TPH-MO was detected at a concentration of 840 µg/L in the effluent sample. TPH-MO was detected in the influent sample at a concentration of 270 µg/L. The effluent trigger level for TPH-MO is 50 µg/L. In accordance with the Special Provisions required under Section VI.C.6 of the NPDES Permit, three samples of both the influent and effluent were collected during the following calendar quarter and analyzed for TPH-MO.

The results of the follow-up trigger level sampling are provided in Table 10, including the original July trigger level exceedance results. All of the trigger level sampling results were below detection levels. A blank sample was created on 8/12/14 using the same lot of sample bottles used for July sampling event. The results of the blank sample were also non-detect, indicating that the sample bottles were not the source of contamination. The laboratory method blank sample was also non-detect. The source of the motor oil in the July samples is unknown.



Because the results of the follow-up trigger level sampling were all non-detect, no future action is required at this time.

Table 10
TPH-MO Trigger Level Sampling Results

Sample Location	Sample Date	TPH-MO (µg/L)
NASA-I	7/23/14	TPH-MO = 270
NASA-E	7/23/14	TPH-MO = 840
NASA-I	8/12/14	ND (9.1)
NASA-E	8/12/14	ND (9.1)
Trip Blank	8/12/14	ND (9.1)
NASA-I	8/26/14	ND (9.1)
NASA-E	8/26/14	ND (9.1)
NASA-I	9/23/14	ND (9.1)
NASA-E	9/23/14	ND (9.1)

ND (9.1) = Not Detected above 9.1 µg/L

5.5 TPH-Gasoline Detection in August Effluent Sample

On the August 26, 2014 sampling event, TPH-gasoline was detected at an estimated concentration ("J" value) of 28 µg/L in the effluent sample. TPH-gasoline was detected in the influent sample at an estimated concentration ("J" value) of 42 µg/L. The effluent trigger level for TPH-gasoline is 50 µg/L. No further action is required at this time.

5.6 TPH-Gasoline Detection in September Effluent Sample

On the September 23, 2014 sampling event, TPH-gasoline was detected at an estimated concentration ("J" value) of 32 µg/L in the effluent sample. TPH-gasoline was detected in the influent sample at an estimated concentration ("J" value) of 43 µg/L. The effluent trigger level for TPH-gasoline is 50 µg/L. No further action is required at this time.



5.7 SVOC Detections in September Effluent Sample

On the September 23, 2014 sampling event, DEHP was detected at an estimated concentration ("J" value) of 0.74 µg/L in the effluent sample. DEHP was detected in the influent sample at an estimated concentration ("J" value) of 1.2 µg/L. The effluent trigger level for DEHP is 1.8 µg/L. No further action is required at this time.

On the September 23, 2014 sampling event, DNOP was detected at an estimated concentration ("J" value) of 1.9 µg/L in the effluent sample. DNOP was detected in the influent sample at an estimated concentration ("J" value) of 2.8 µg/L. Neither an effluent limitation concentration nor a trigger level concentration has been established for DNOP. No further action is required at this time.

5.8 October TPH-Gasoline Detection in October Effluent Sample

On the October 22, 2014 sampling event, TPH-gasoline was detected at an estimated concentration ("J" value) of 29 µg/L in the effluent sample. TPH-gasoline was detected in the influent sample at an estimated concentration ("J" value) of 37 µg/L. The effluent trigger level for TPH-gasoline is 50 µg/L. No further action is required at this time.

5.9 SVOC Detections in October Effluent Sample

On the October 22, 2014 sampling event, DEHP was detected at an estimated concentration ("J" value) of 0.86 µg/L in the effluent sample. The effluent trigger level for DEHP is 1.8 µg/L. No further action is required at this time.

On the October 22, 2014 sampling event, DNOP was detected at an estimated concentration ("J" value) of 1.2 µg/L in the effluent sample. Neither an effluent limitation concentration nor a trigger level concentration has been established for DNOP. No further action is required at this time.

5.10 TPH-Gasoline Detection in December Effluent Sample

On the December 9, 2014 sampling event, TPH-gasoline was detected at an estimated concentration ("J" value) of 22 µg/L in the effluent sample. TPH-gasoline was not detected in the influent sample. The effluent trigger level for TPH-gasoline is 50 µg/L. No further action is required at this time.



5.11 Priority Pollutant Metal Detections in December Effluent Sample

On the December 9, 2014 sampling event, arsenic, chromium, copper, nickel and thallium were detected in the effluent sample at concentrations well below their respective trigger level. No further action is required at this time.

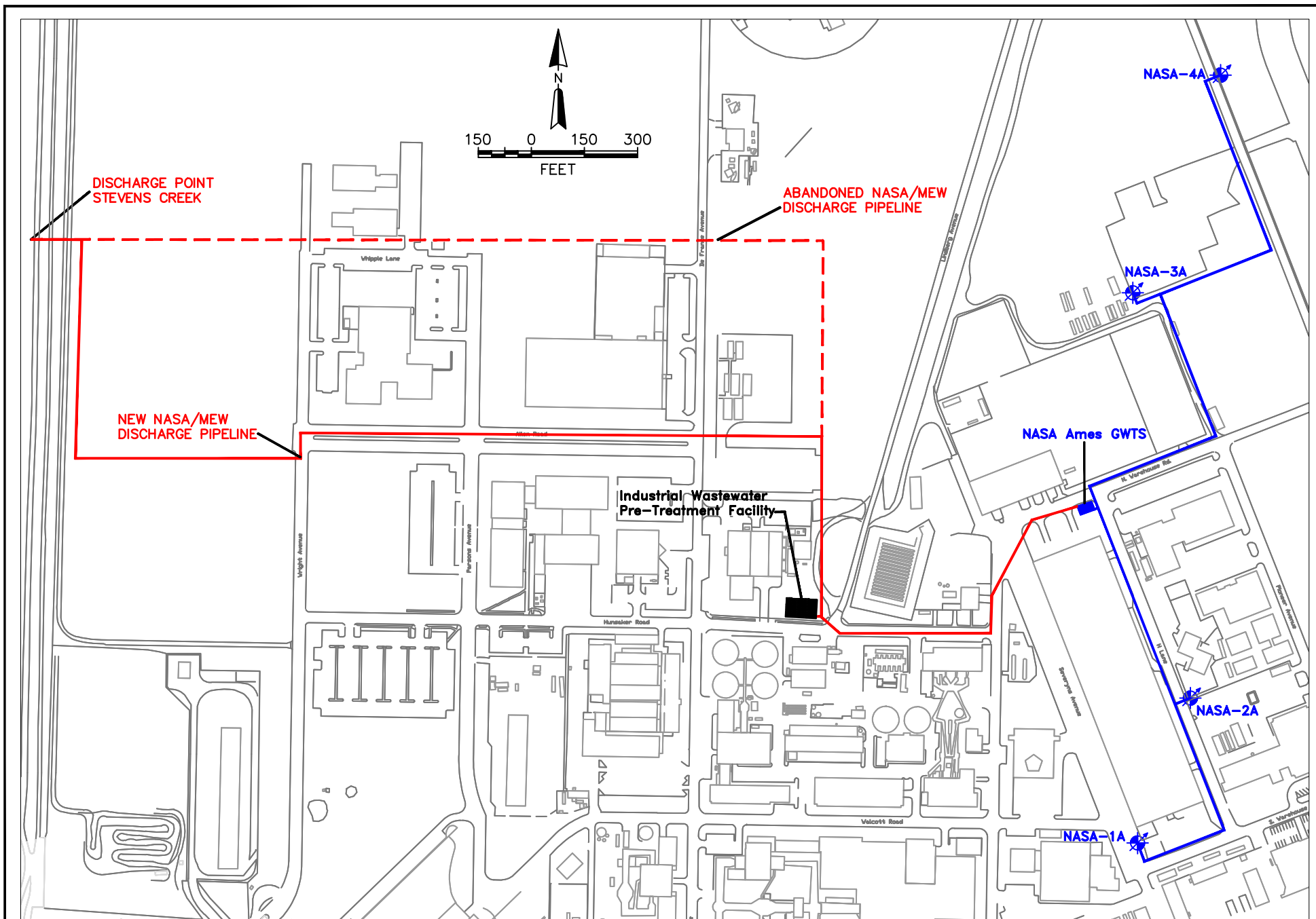
5.12 Treated Groundwater Reuse

None of NASA's treated groundwater was reused during this reporting period. Reuse may resume pending modifications to NASA's Industrial Wastewater Pre-Treatment Facility.



6 Conclusions

Data presented in Tables 1 through 10 indicate that the NASA Ames GWTS was in compliance with the effluent discharge limitations set forth in the August 25, 2014 NPDES permit during this reporting period.



Ames Research Center
Moffett Field, California 94035

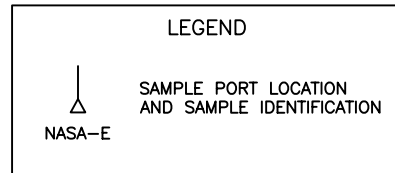
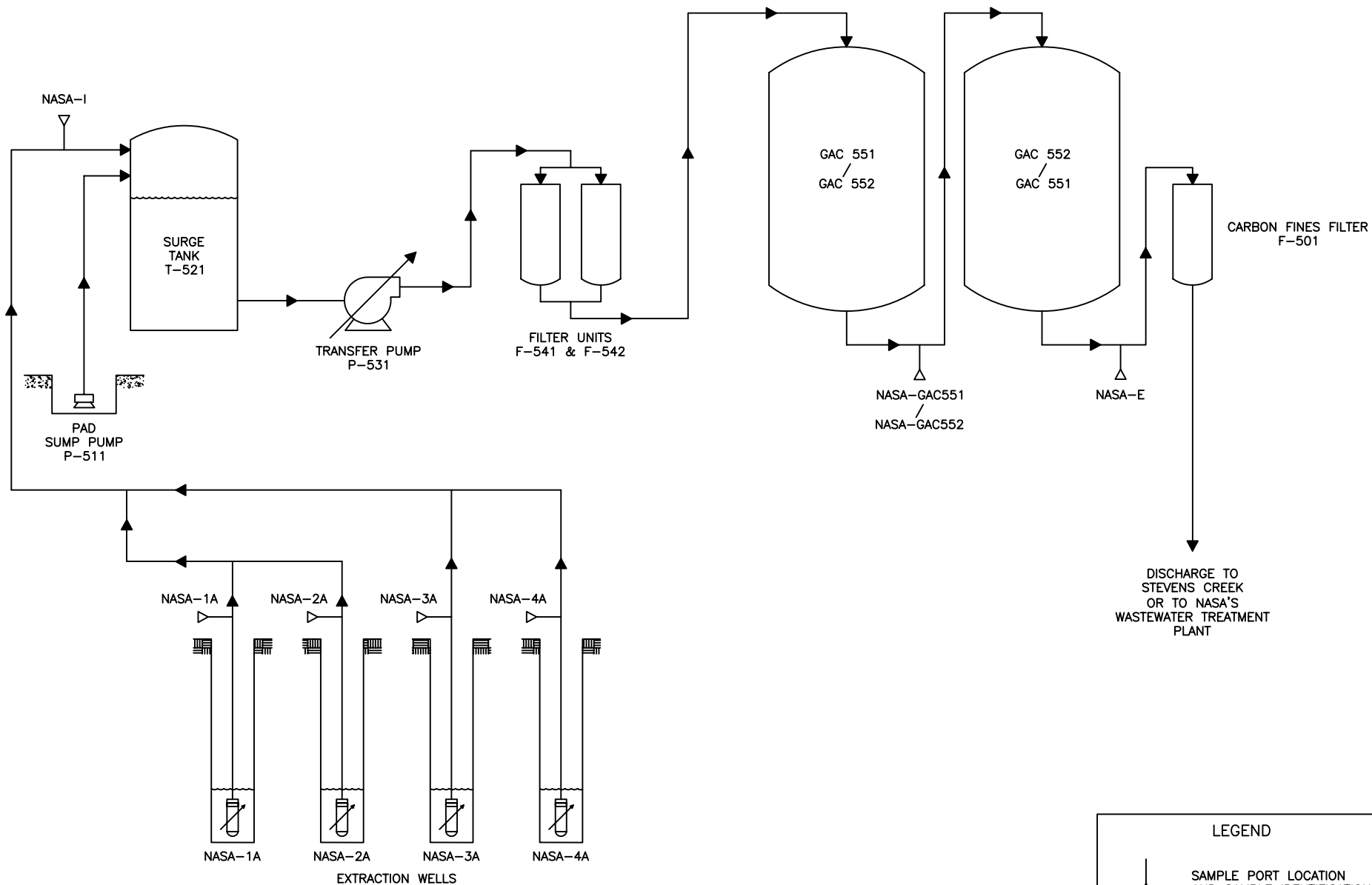
TITLE:

NASA Ames Groundwater Treatment System
Extraction Wells, Treatment Piping, Discharge Pipeline, and Discharge Point

DWN:
CHKD:
DATE:

DES.:
APPD:
REV.:

PROJECT NO.:
RGRP GWTS
FIGURE NO.:
1



TITLE:
NASA AMES RGRP GWTS
GWTS FLOW DIAGRAM AND SAMPLE PORT LOCATIONS

DWN: CNF	DES.: CNF	PROJECT NO.: RGRP GWTS
CHKD: DHV	APPD: JRL	FIGURE NO.: 2
DATE: 03/2003	REV.: 02	



APPENDIX B

CY2014 Depth-to-Water Measurements

APPENDIX B
2014 Depth-to-Water Measurements

Well	Date	Measuring Point Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
10B01A	3/20/2014	5.85	7.54	-1.69
10B01A	9/18/2014	5.85	9.41	-3.56
10B04A	3/20/2014	1.76	3.70	-1.94
10B04A	9/18/2014	1.76	5.12	-3.36
10G04A	3/20/2014	3.59	5.15	-1.56
10G04A	9/18/2014	3.59	6.44	-2.85
10H01A	3/20/2014	5.16	7.22	-2.06
10H01A	9/18/2014	5.16	8.36	-3.20
10H02A	3/20/2014	2.26	3.87	-1.61
10H02A	9/18/2014	2.26	5.75	-3.49
10J04A	3/20/2014	3.89	4.29	-0.40
10J04A	9/18/2014	3.89	5.85	-1.96
10J05A	3/20/2014	6.34	6.06	0.28
10J05A	9/18/2014	6.34	7.49	-1.15
10J09A	3/20/2014	3.70	5.31	-1.61
10J09A	9/18/2014	3.70	6.22	-2.52
10Q08A	3/20/2014	6.54	4.47	2.07
10Q08A	9/18/2014	6.54	5.70	0.84
10R09A	3/20/2014	8.78	7.42	1.36
10R09A	9/18/2014	8.78	8.81	-0.03
10R10A	3/20/2014	9.15	7.03	2.12
10R10A	9/18/2014	9.15	8.38	0.77
10R11A	3/20/2014	9.25	7.84	1.41
10R11A	9/18/2014	9.25	9.28	-0.03
11E02A	3/20/2014	4.76	6.99	-2.23
11E02A	9/18/2014	4.76	7.91	-3.15
11M02A	3/20/2014	4.27	5.01	-0.74
11M02A	9/18/2014	4.27	6.10	-1.83
11M03A	3/20/2014	6.51	7.73	-1.22
11M03A	9/18/2014	6.51	8.76	-2.25
11M07A	3/20/2014	5.86	6.30	-0.44
11M07A	9/18/2014	5.86	7.53	-1.67
11M14A1	3/20/2014	8.26	8.88	-0.62
11M14A1	9/18/2014	8.26	9.95	-1.69

APPENDIX B
2014 Depth-to-Water Measurements

Well	Date	Measuring Point Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
11M16A1	3/20/2014	8.79	9.66	-0.87
11M16A1	9/18/2014	8.79	10.60	-1.81
11M17A	3/20/2014	4.16	4.80	-0.64
11M17A	9/18/2014	4.16	6.01	-1.85
11M18A1	3/20/2014	3.72	4.54	-0.82
11M18A1	9/18/2014	3.72	5.84	-2.12
11M21A	3/20/2014	7.10	7.43	-0.33
11M21A	9/18/2014	7.10	8.67	-1.57
11M25A	9/18/2014	3.73	6.07	-2.34
11N21A1	3/20/2014	6.14	6.22	-0.08
11N21A1	9/18/2014	6.14	7.25	-1.11
11N22A1	3/20/2014	10.75	10.40	0.35
11N22A1	9/18/2014	10.75	11.53	-0.78
11N27A	3/20/2014	12.25	10.97	1.28
11N27A	9/18/2014	12.25	12.14	0.11
12L03A	3/20/2014	10.62	8.23	2.39
14C06A	3/20/2014	15.02	9.77	5.25
14C06A	9/18/2014	15.02	11.31	3.71
14C15A	3/20/2014	13.39	7.20	6.19
14C15A	9/18/2014	13.39	8.68	4.71
14C33A	3/20/2014	13.55	8.84	4.71
14C33A	9/18/2014	13.55	10.00	3.55
14C40A	3/20/2014	11.49	7.49	4.00
14C40A	9/18/2014	11.49	8.90	2.59
14C60A	3/20/2014	10.27	7.92	2.35
14C60A	9/18/2014	10.27	9.35	0.92
14D02A	3/20/2014	10.15	6.42	3.73
14D02A	9/18/2014	10.15	7.74	2.41
14D05A	3/20/2014	14.68	6.16	8.52
14D05A	9/18/2014	14.68	Obstructed	NM
14D09A	3/20/2014	15.81	9.00	6.81
14D09A	9/18/2014	15.81	9.94	5.87
14D12A	3/20/2014	14.78	8.11	6.67
14D12A	9/18/2014	14.78	9.84	4.94

APPENDIX B
2014 Depth-to-Water Measurements

Well	Date	Measuring Point Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
14D13A	3/20/2014	13.19	6.69	6.50
14D13A	9/18/2014	13.19	7.68	5.51
14D24A	3/20/2014	8.29	13.16	-4.87
14D24A	9/18/2014	8.29	Dry	NM
14D26A1	3/20/2014	8.35	16.88	-8.53
14D26A1	9/18/2014	8.35	17.82	-9.47
14D29A	3/20/2014	13.93	7.96	5.97
14D29A	9/18/2014	13.93	9.28	4.65
14D33A	3/20/2014	10.00	6.79	3.21
14D33A	9/18/2014	10.00	8.02	1.98
14D35A	3/20/2014	9.29	6.34	2.95
14D35A	9/18/2014	9.29	7.59	1.70
14D36A	3/20/2014	12.05	7.20	4.85
14D36A	9/18/2014	12.05	8.49	3.56
14D37A	3/20/2014	8.19	5.66	2.53
14D37A	9/18/2014	8.19	6.86	1.33
14D39A	3/20/2014	12.51	8.40	4.11
14D39A	9/18/2014	12.51	9.49	3.02
14E14A	3/20/2014	21.64	10.92	10.72
14E14A	9/18/2014	21.64	11.57	10.07
15A01A	3/20/2014	15.36	10.01	5.35
15A01A	9/18/2014	15.36	11.32	4.04
15A02A	3/20/2014	17.14	6.74	10.40
15A02A	9/18/2014	17.14	7.47	9.67
15A04A	3/20/2014	14.24	7.70	6.54
15A04A	9/18/2014	14.24	8.65	5.59
15A06A	3/20/2014	15.24	6.35	8.89
15A06A	9/18/2014	15.24	7.42	7.82
15A08A	3/20/2014	14.31	6.84	7.47
15A08A	9/18/2014	14.31	8.00	6.31
15A16A	3/20/2014	12.21	8.60	3.61
15A16A	9/18/2014	12.21	10.05	2.16
15A18A	3/20/2014	12.74	7.98	4.76
15A18A	9/18/2014	12.74	9.31	3.43

APPENDIX B
2014 Depth-to-Water Measurements

Well	Date	Measuring Point Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
15B08A	3/20/2014	14.75	6.77	7.98
15B08A	9/18/2014	14.75	7.87	6.88
15B09A	3/20/2014	13.20	6.36	6.84
15B09A	9/18/2014	13.20	7.45	5.75
15B10A	3/20/2014	15.30	5.65	9.65
15B10A	9/18/2014	15.30	6.69	8.61
15H05A	3/20/2014	18.69	5.85	12.84
15H05A	9/18/2014	18.69	6.99	11.70
15H12A	3/20/2014	14.77	5.87	8.90
15H12A	9/18/2014	14.77	6.70	8.07
TANK1-E	3/20/2014	16.45	6.74	9.71
TANK1-E	9/18/2014	16.45	7.60	8.85
10R07A2	3/20/2014	10.70	8.37	2.33
10R07A2	9/18/2014	10.70	9.73	0.97
14D25A2	3/20/2014	8.30	5.90	2.40
14D25A2	9/18/2014	8.30	7.02	1.28
14D31A2	3/20/2014	8.02	6.05	1.97
14D31A2	9/18/2014	8.02	7.26	0.76
15A12A2	3/20/2014	16.94	7.39	9.55
15A12A2	9/18/2014	16.94	7.89	9.05
15A15A2	3/20/2014	12.35	8.77	3.58
15A15A2	9/18/2014	12.35	9.90	2.45
15B17A2	3/20/2014	14.83	5.67	9.16
15B17A2	9/18/2014	14.83	6.72	8.11
15B18A2	3/20/2014	15.20	5.80	9.40
15B18A2	9/18/2014	15.20	6.69	8.51

ft = feet

MSL = mean sea level

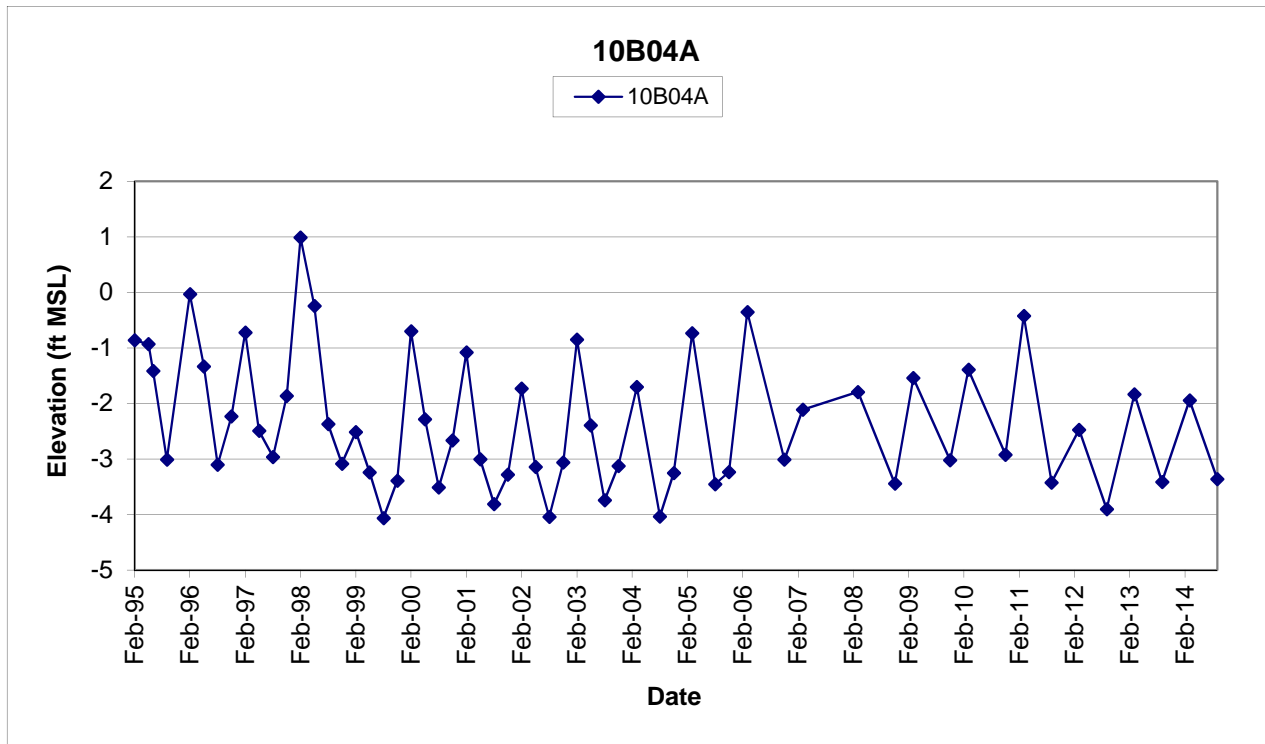
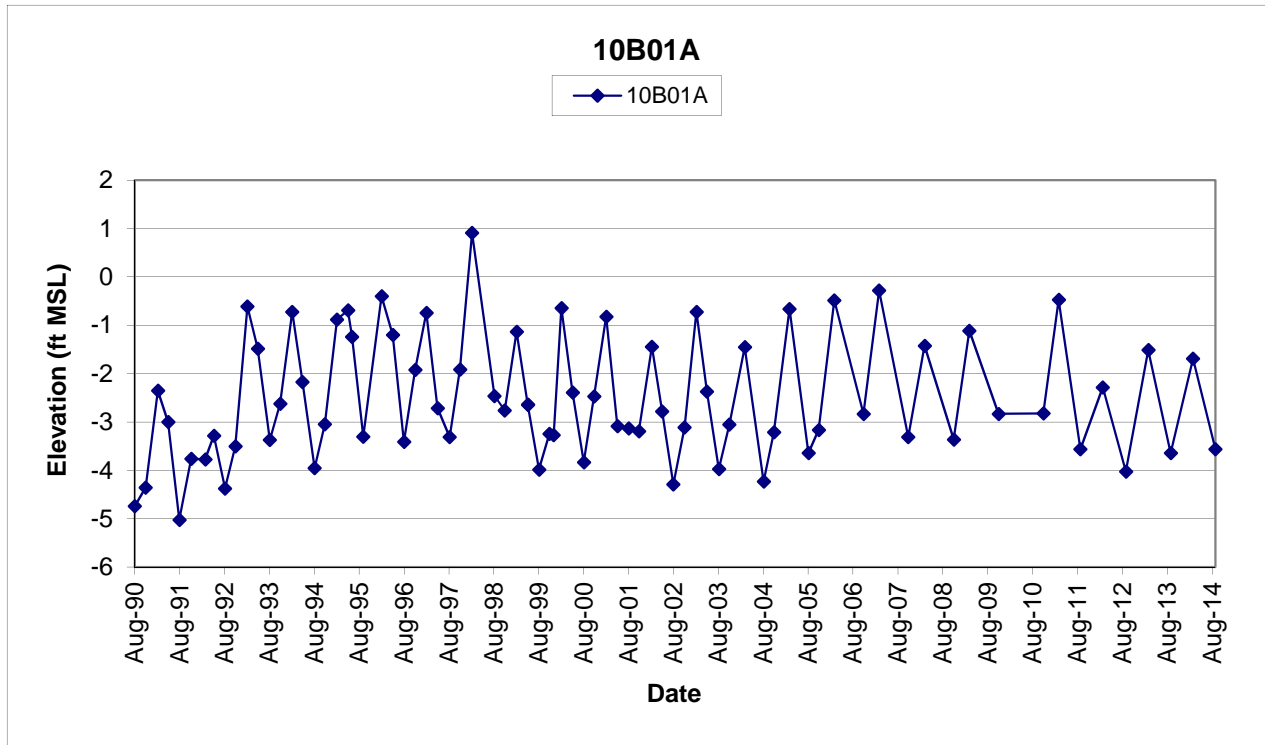
NM = not measured



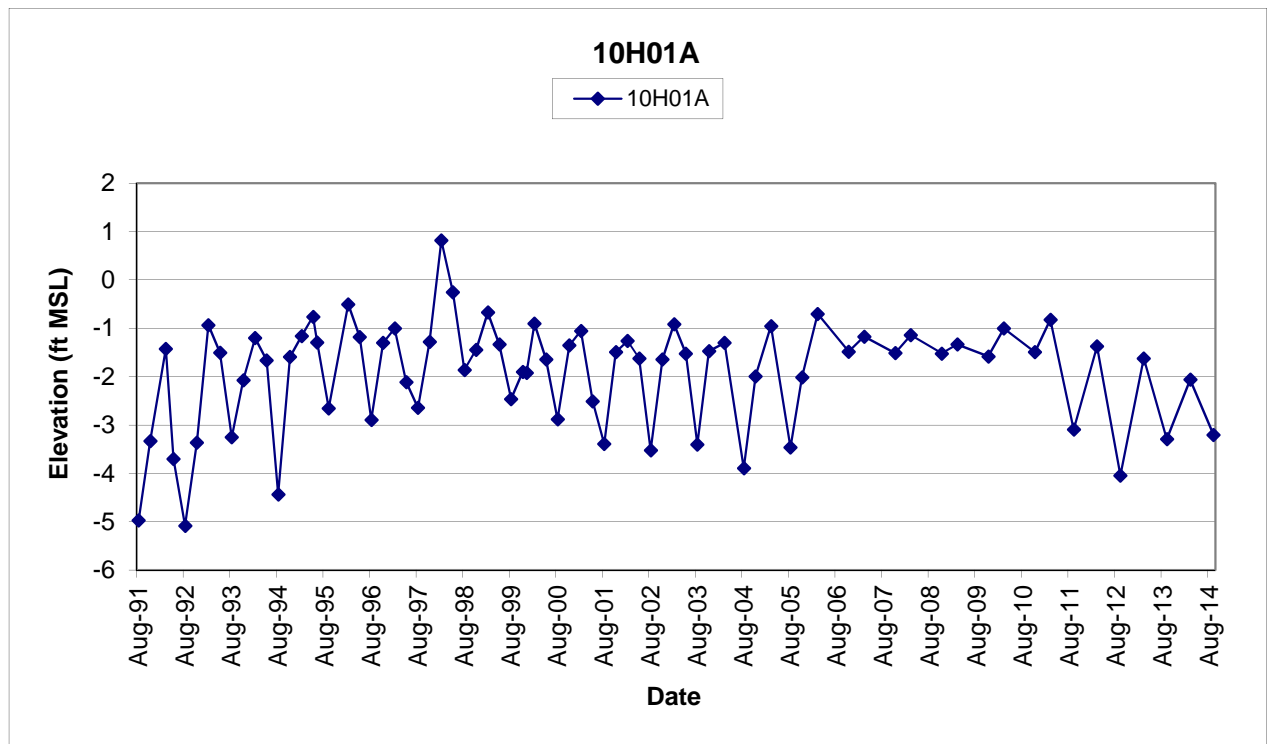
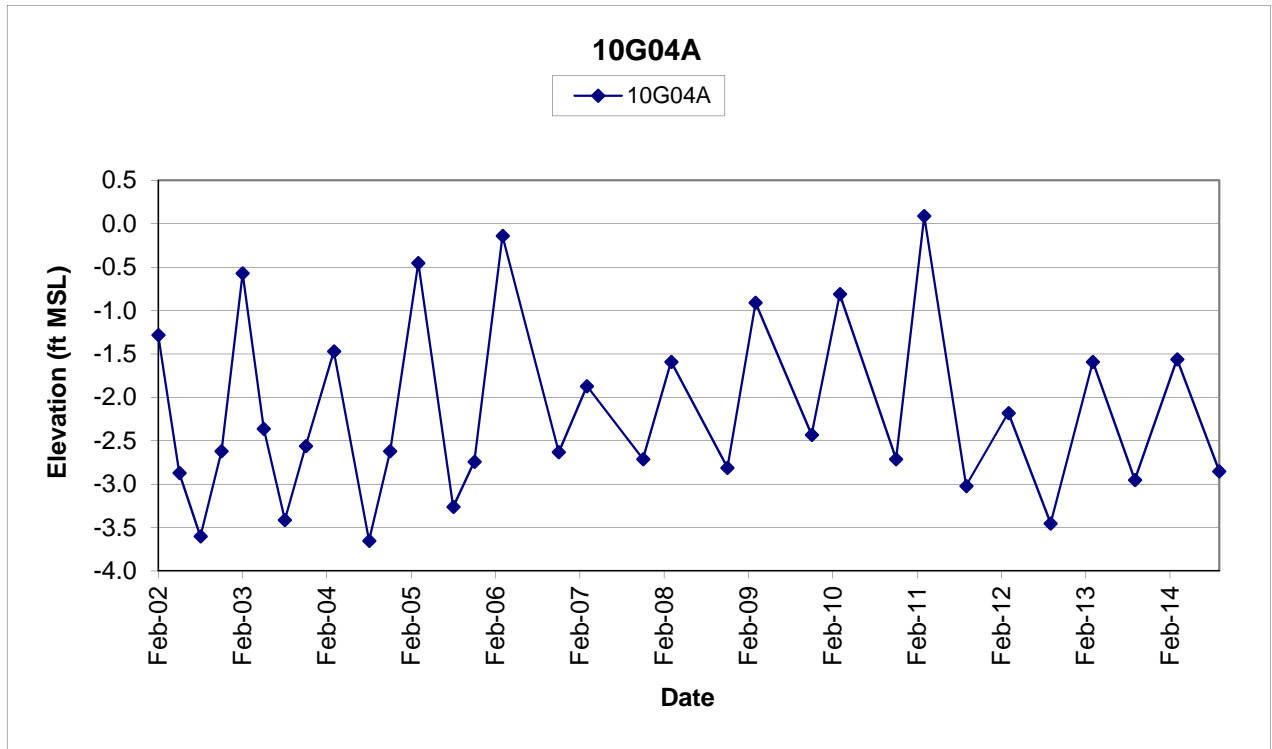
APPENDIX C

Hydrographs

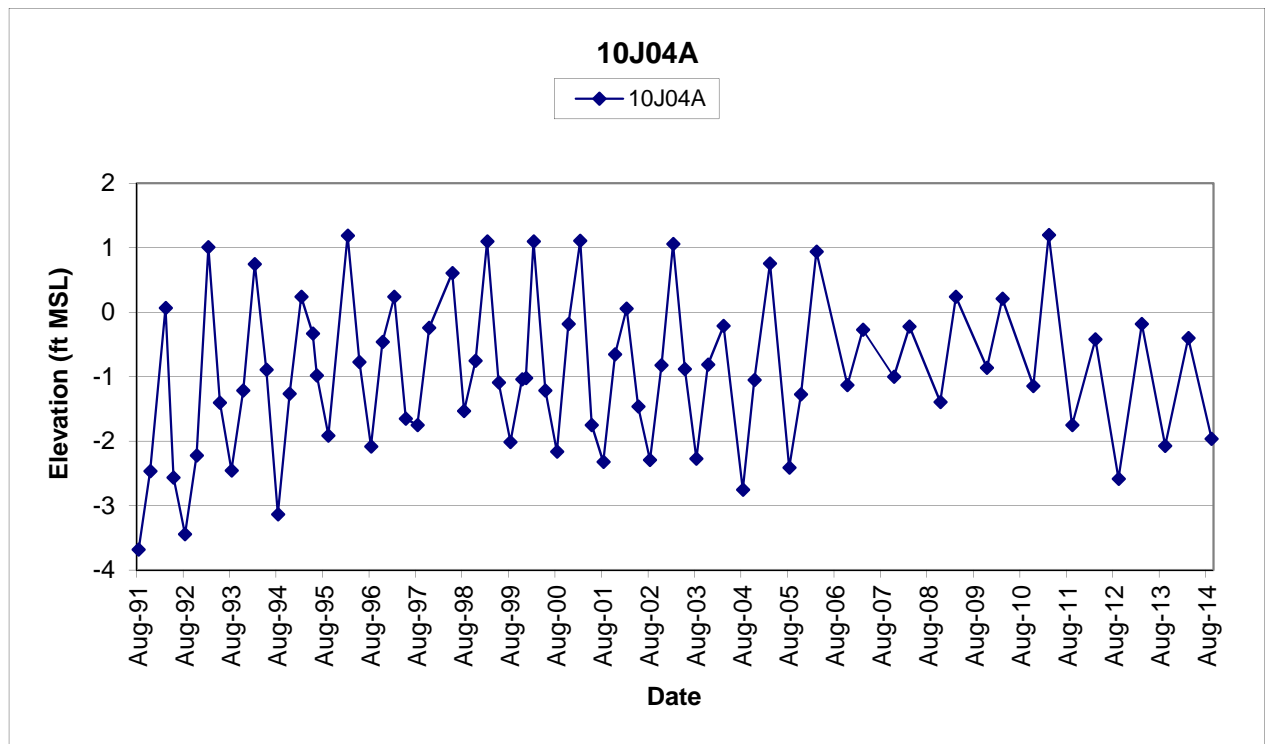
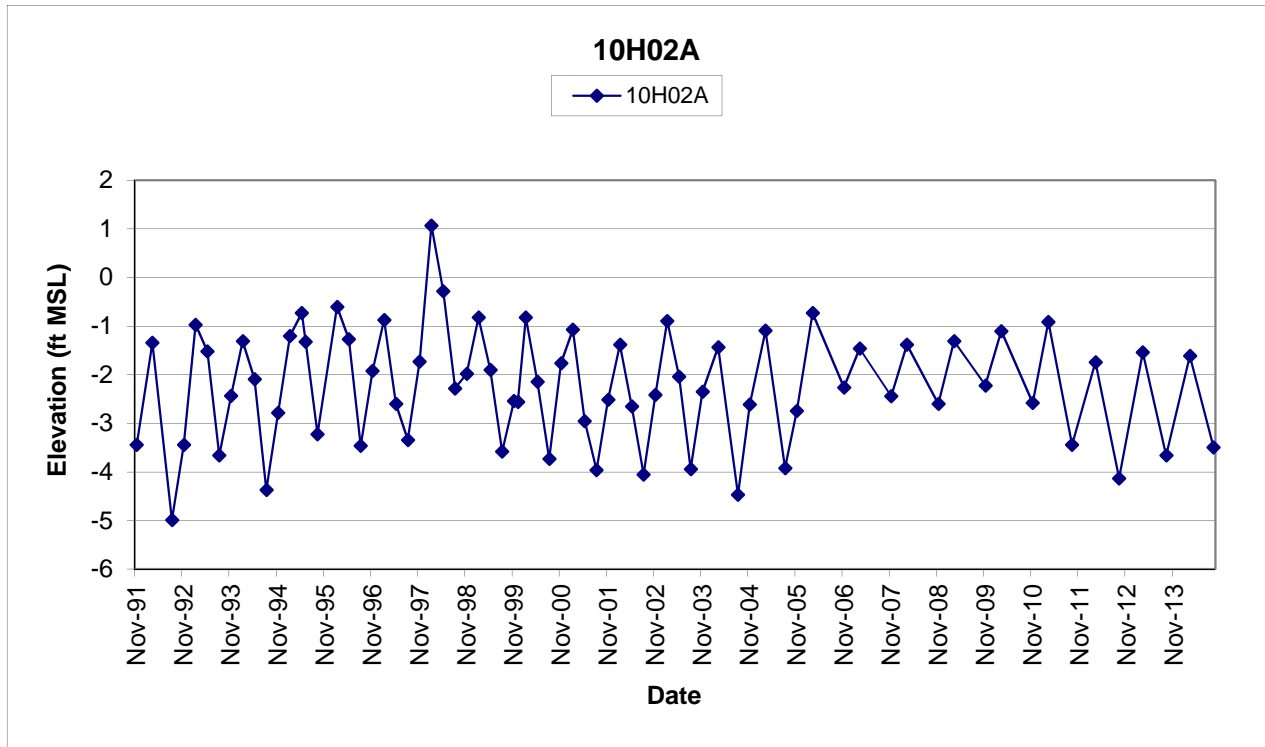
APPENDIX C
CY2014 Hydrographs



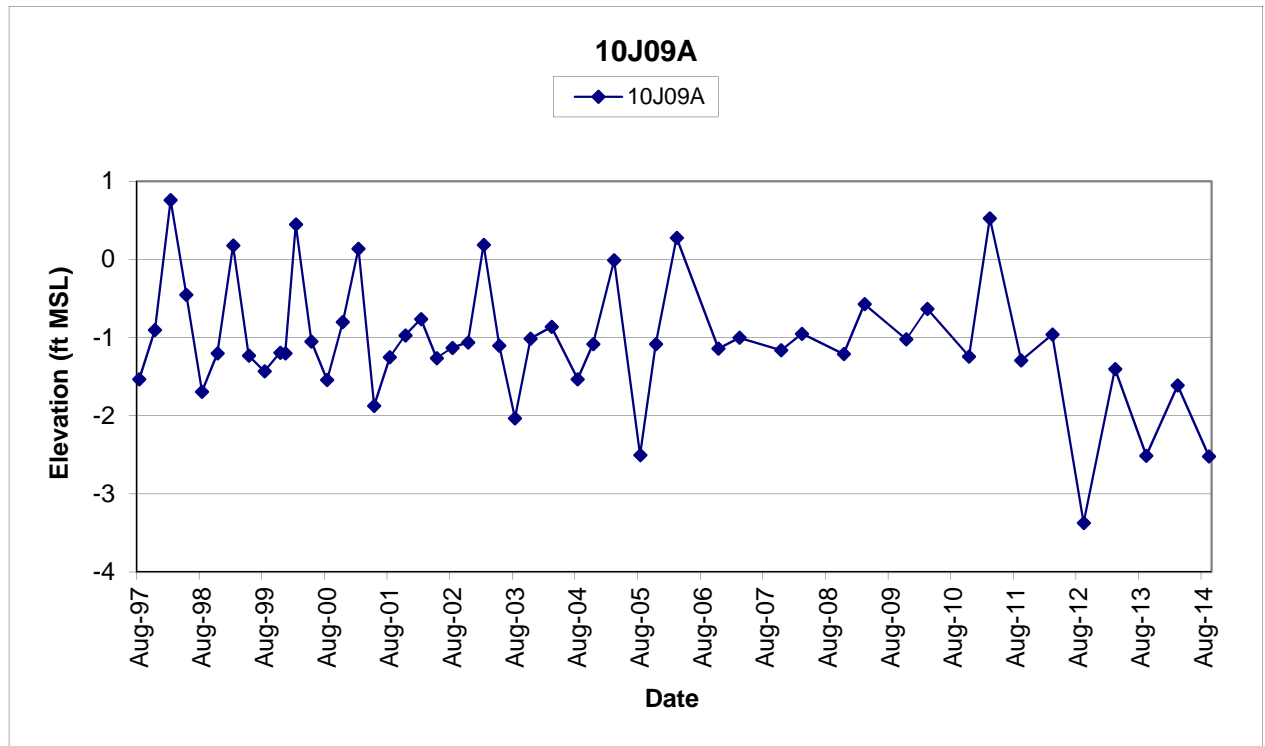
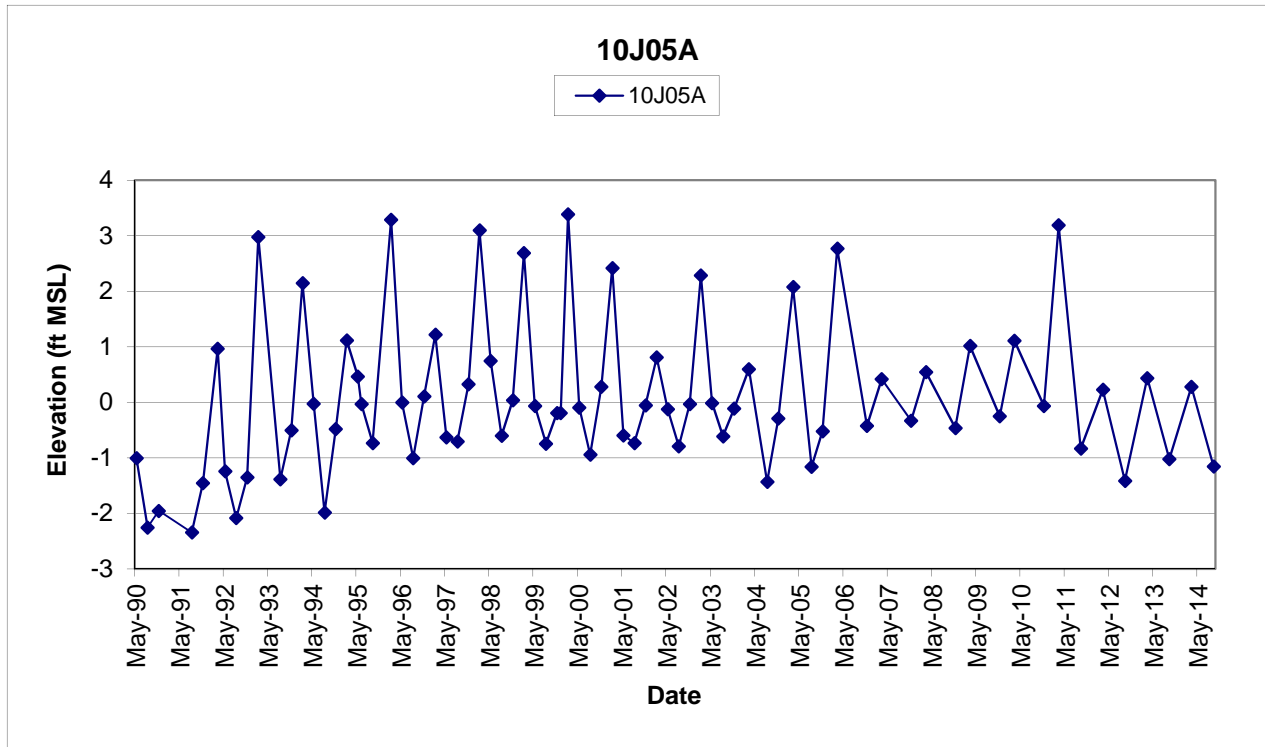
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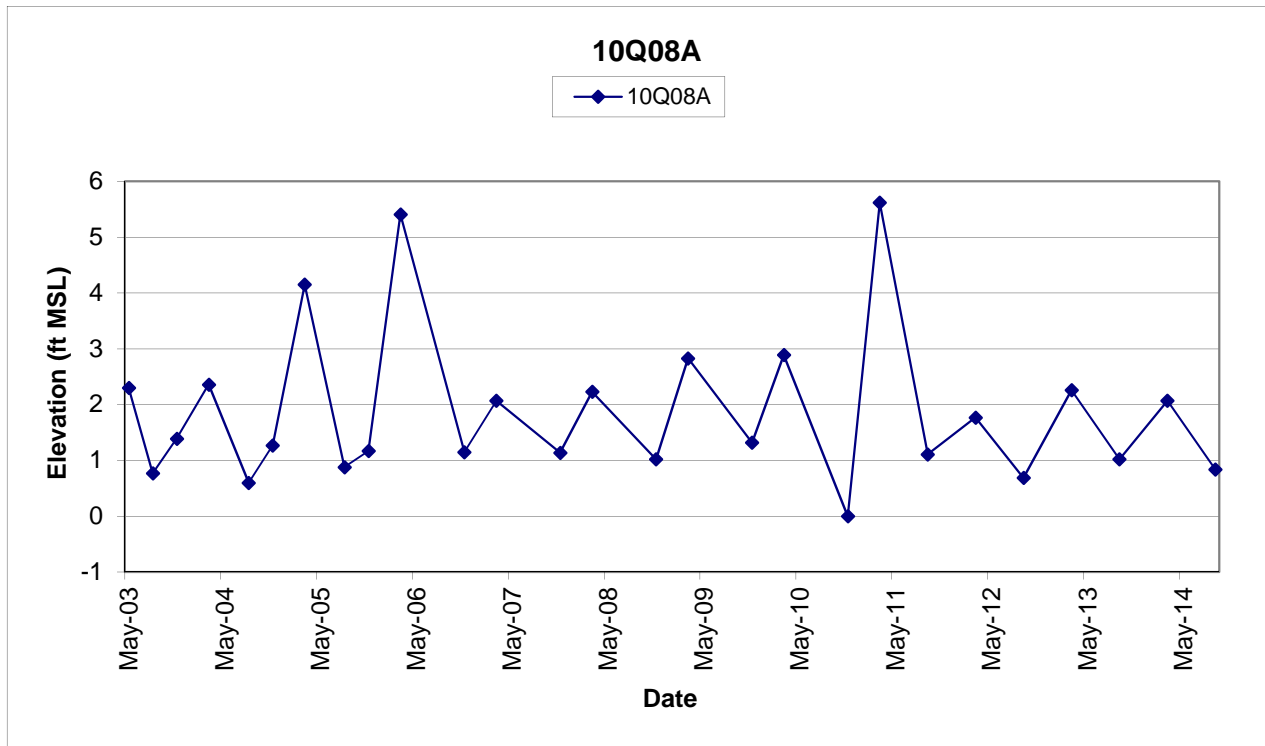
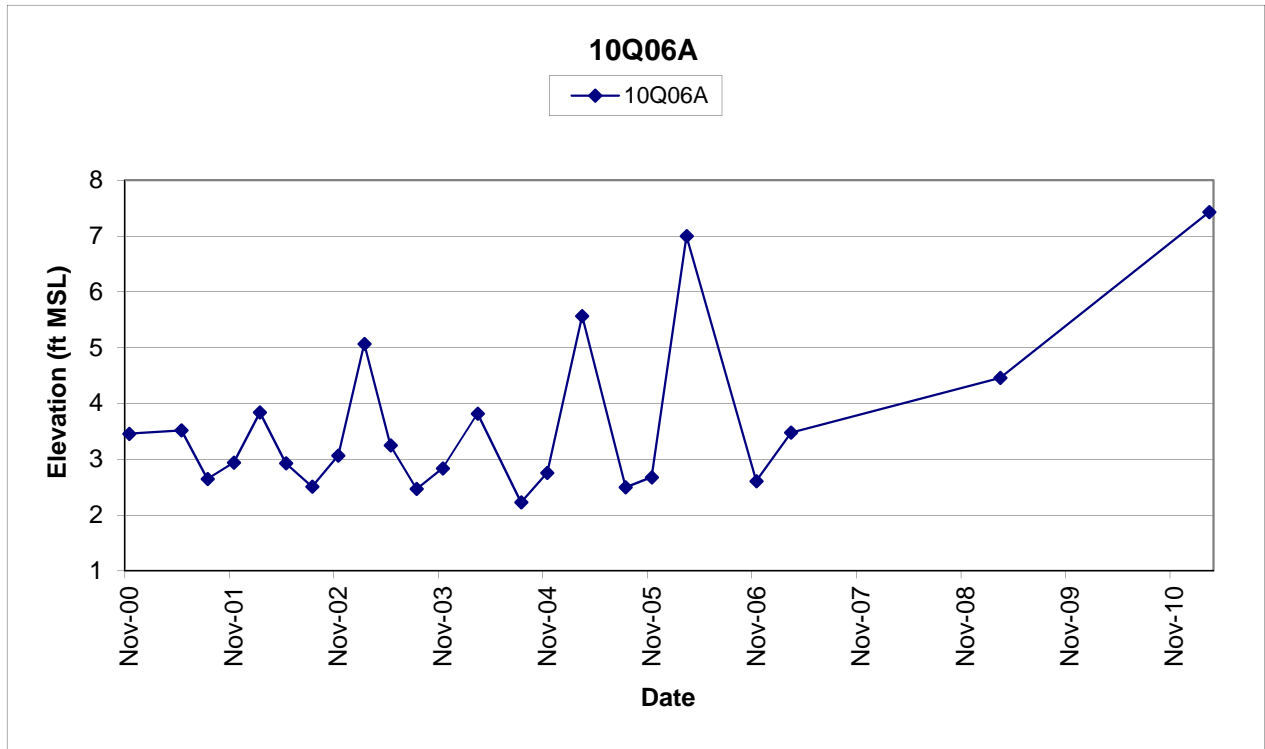
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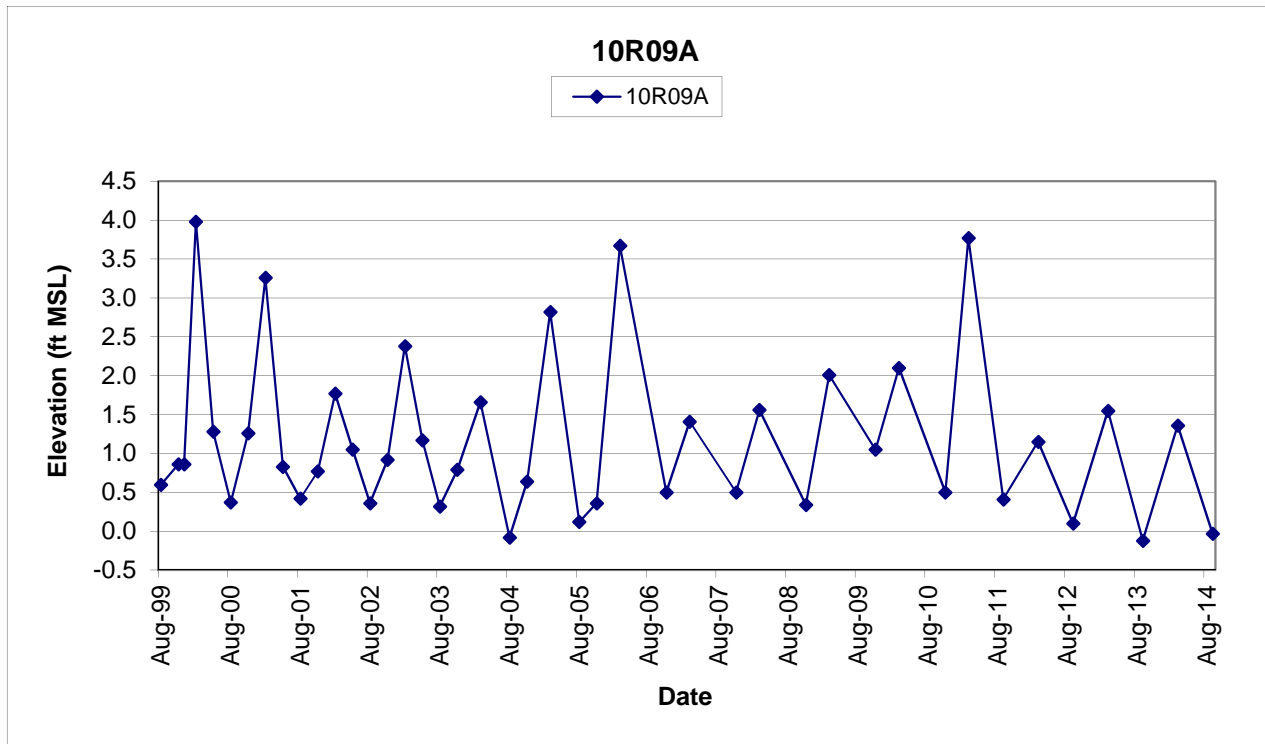
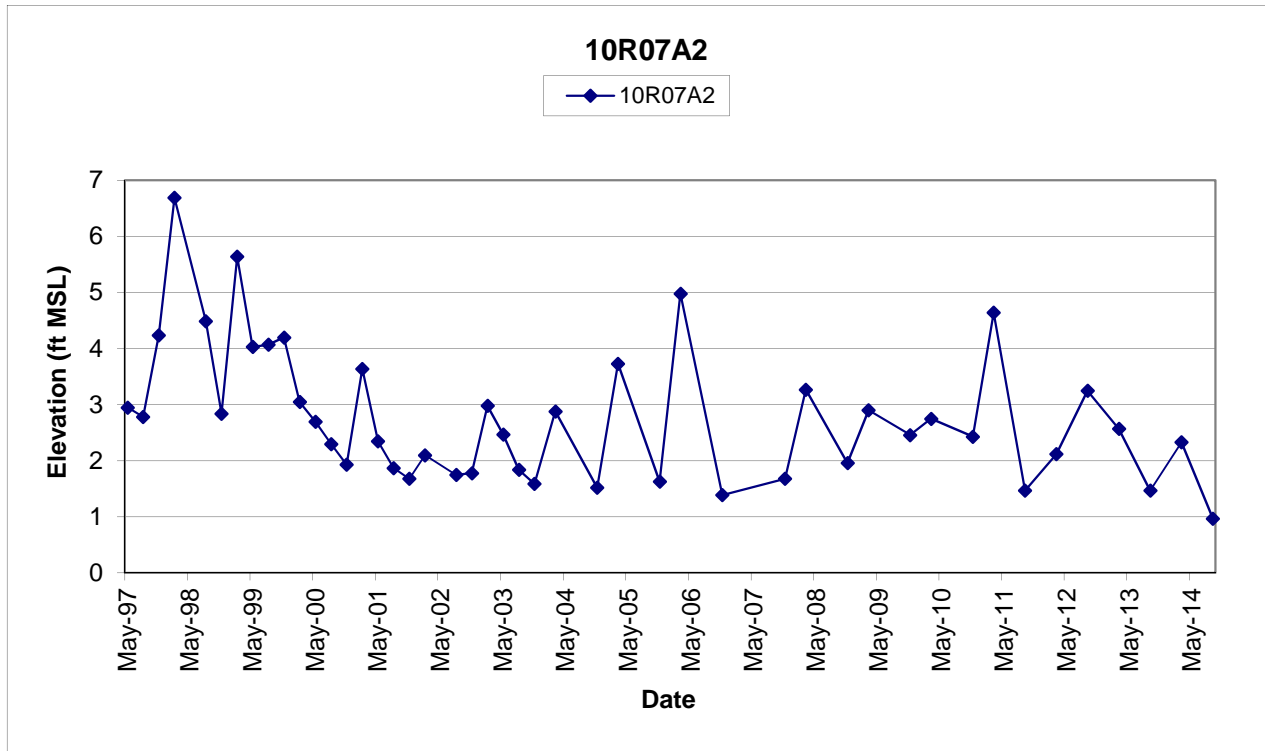
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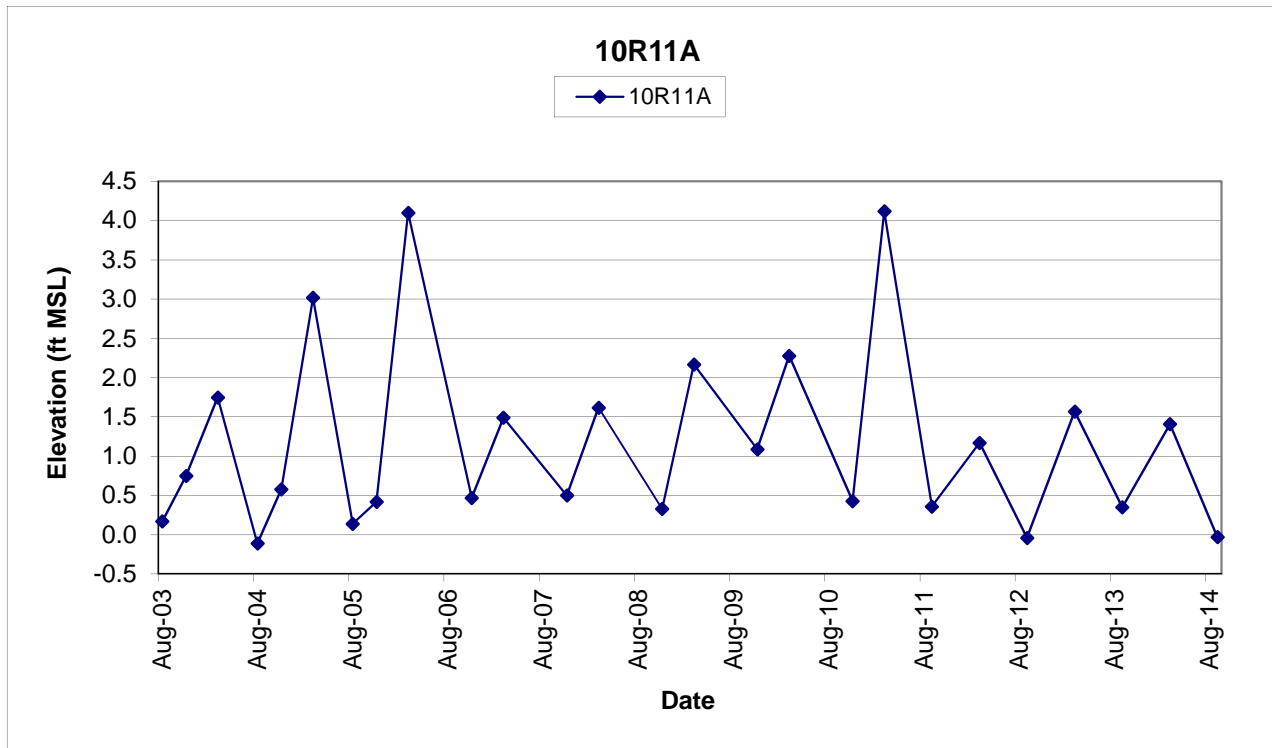
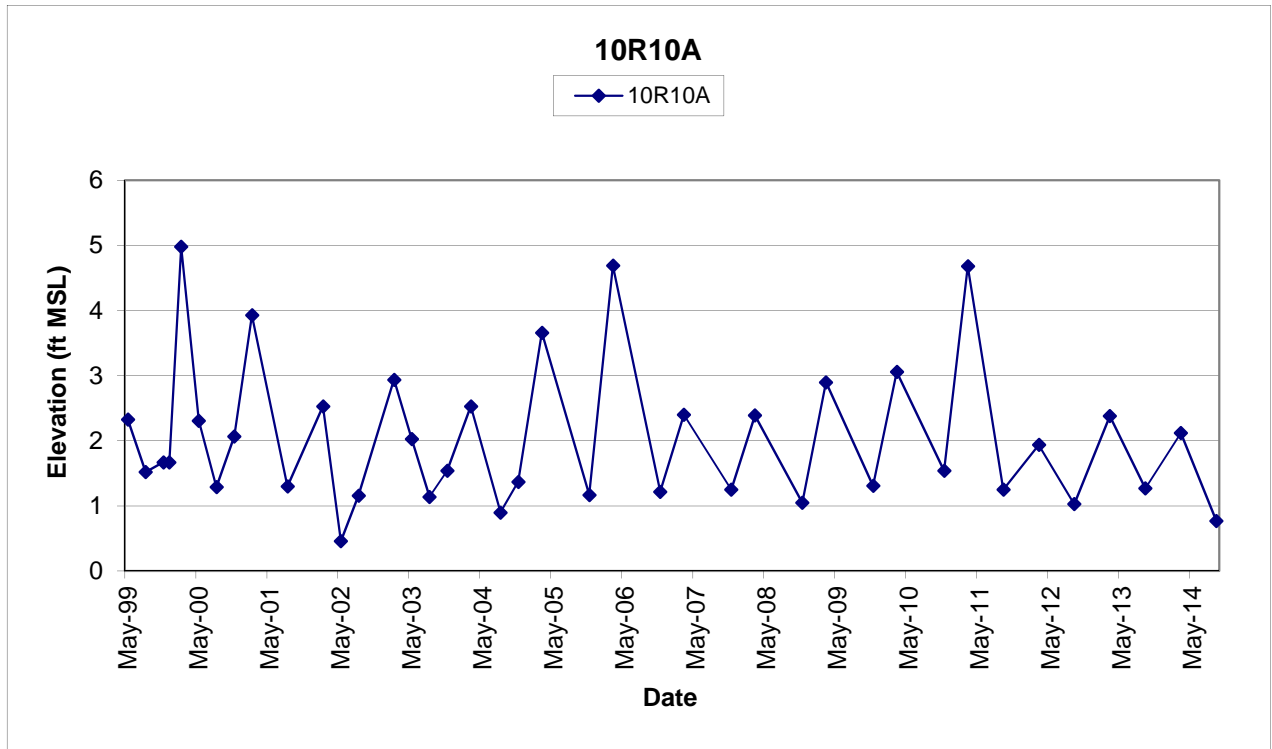
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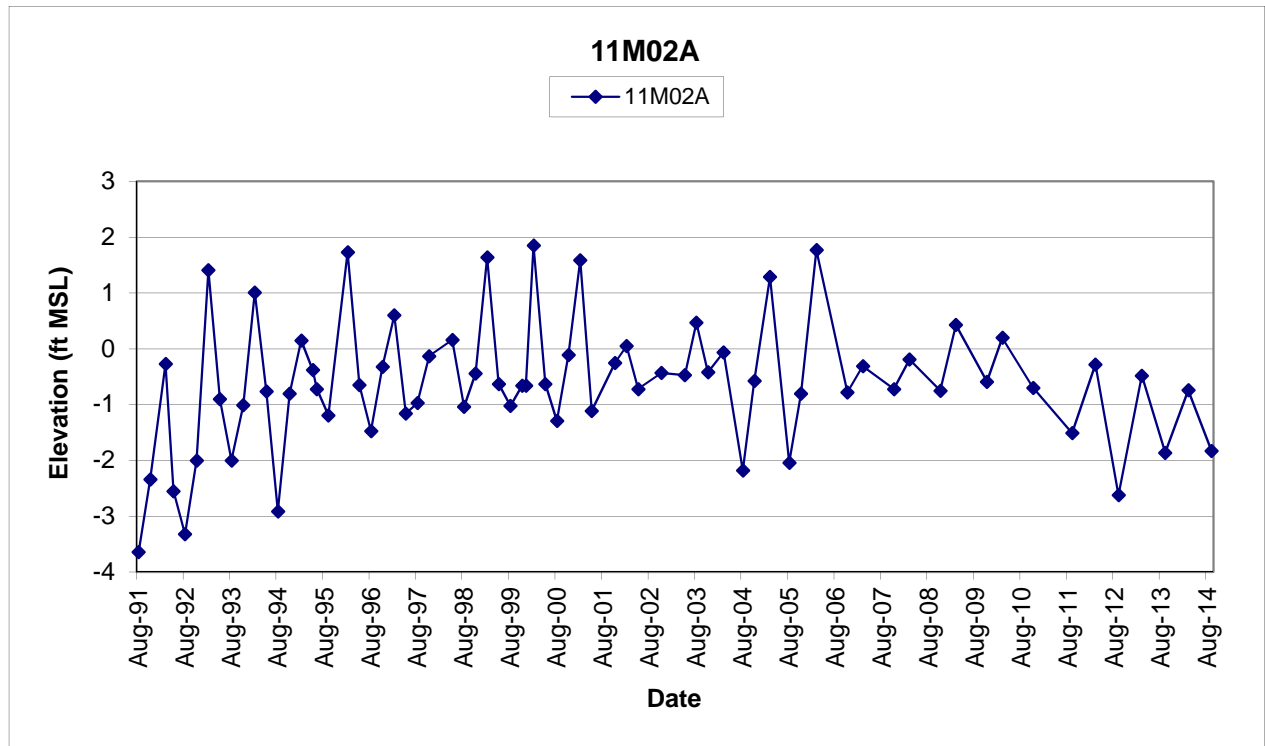
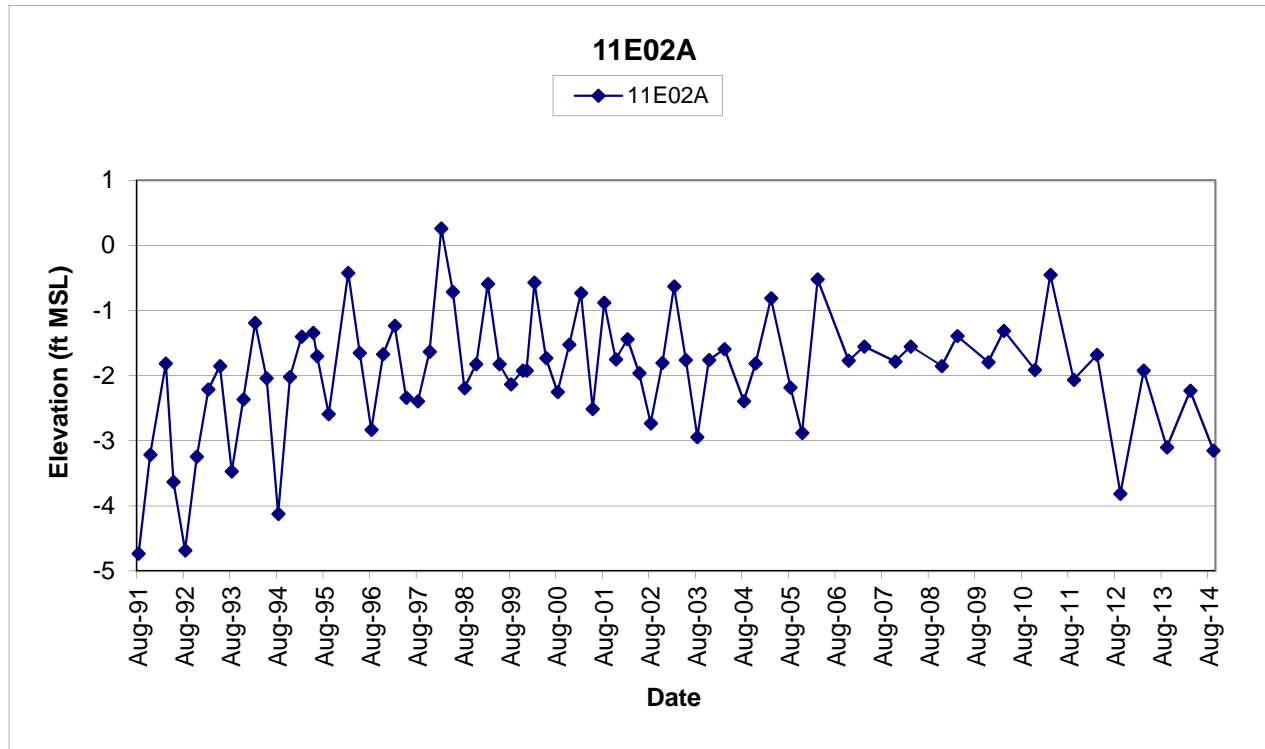
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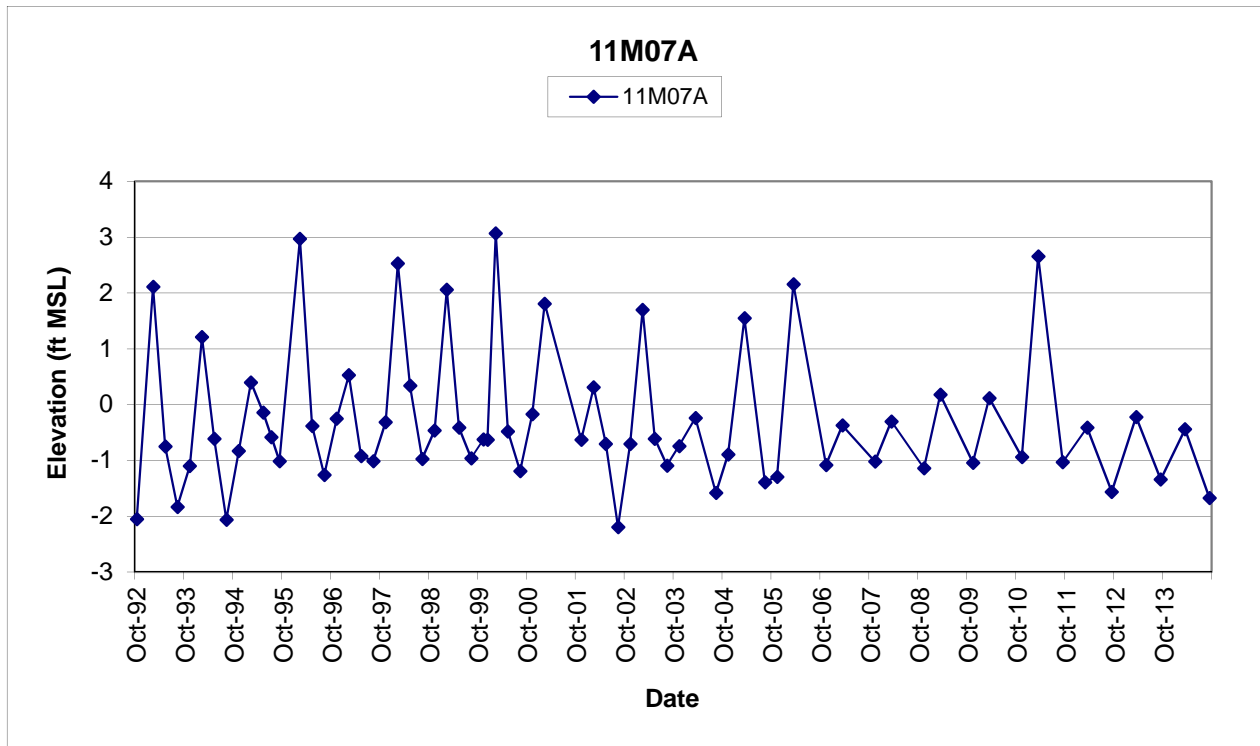
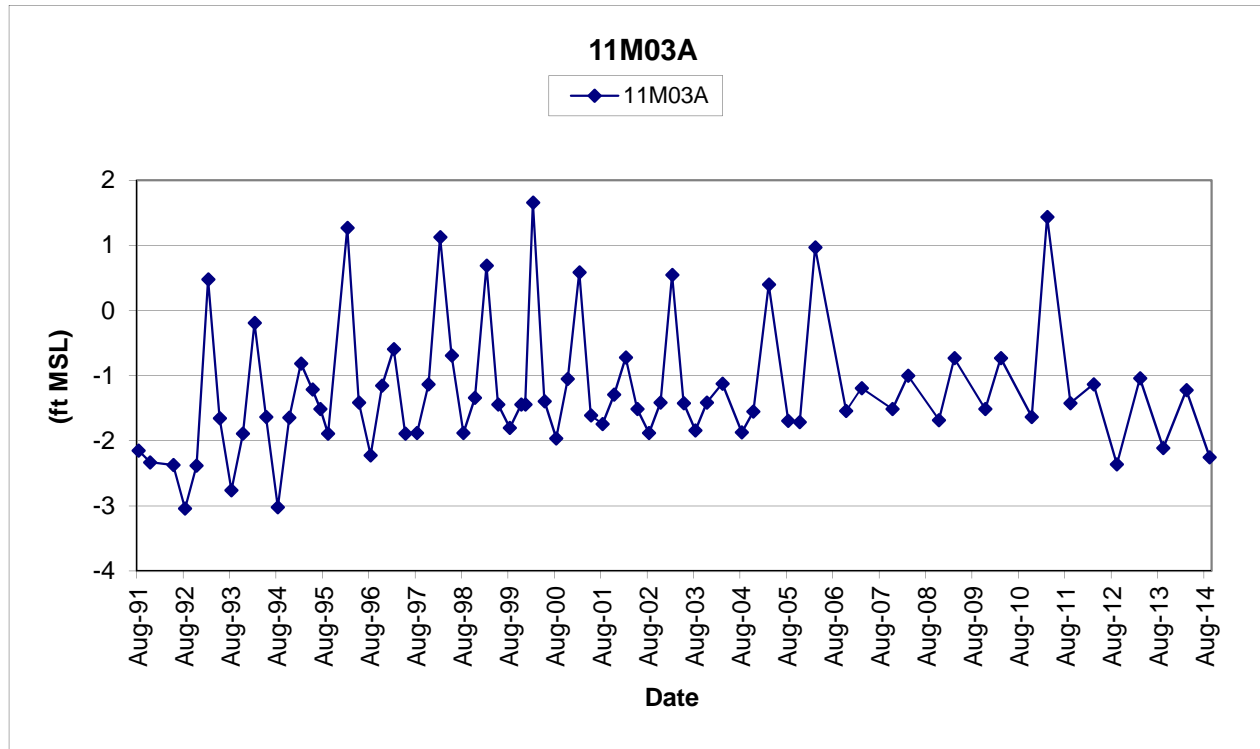
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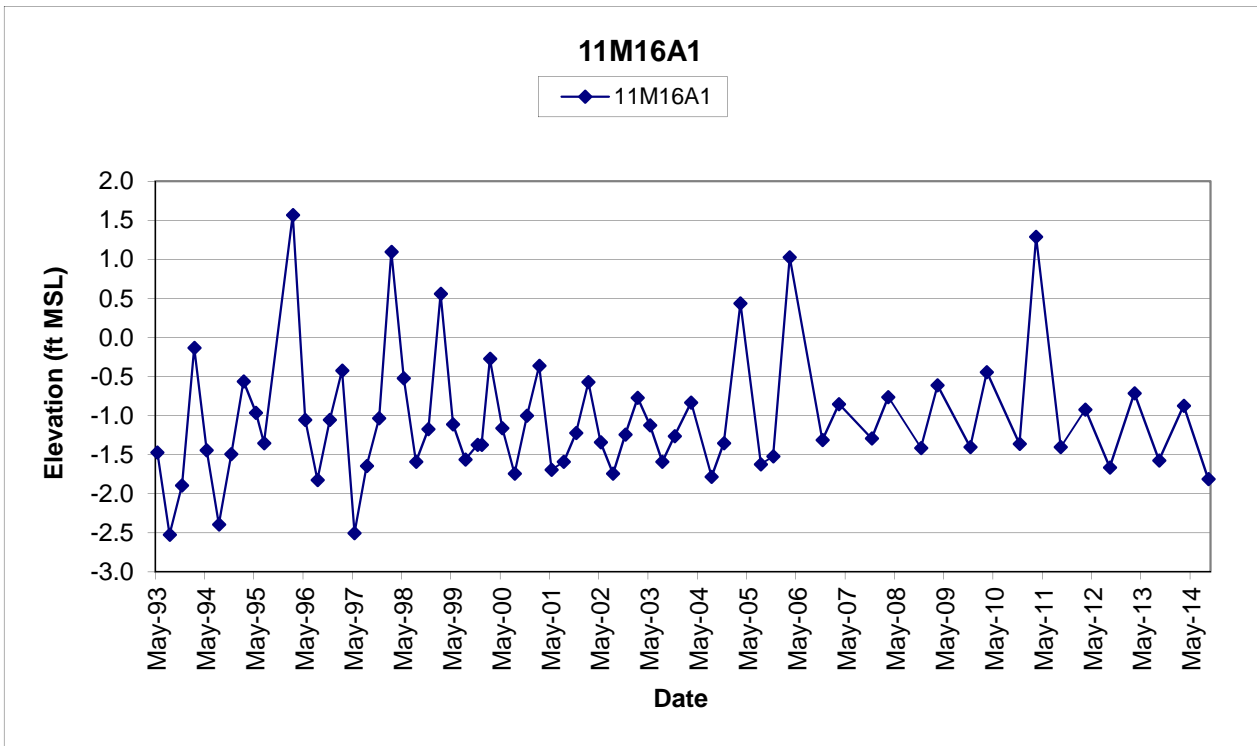
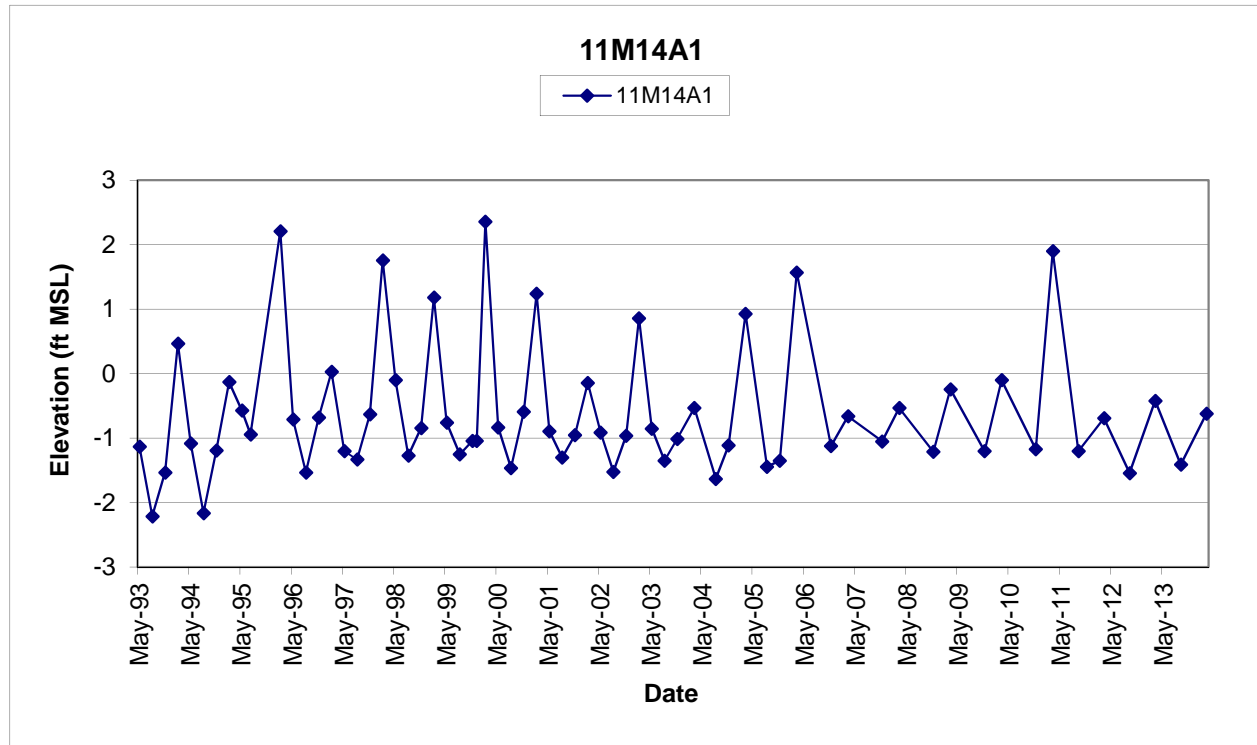
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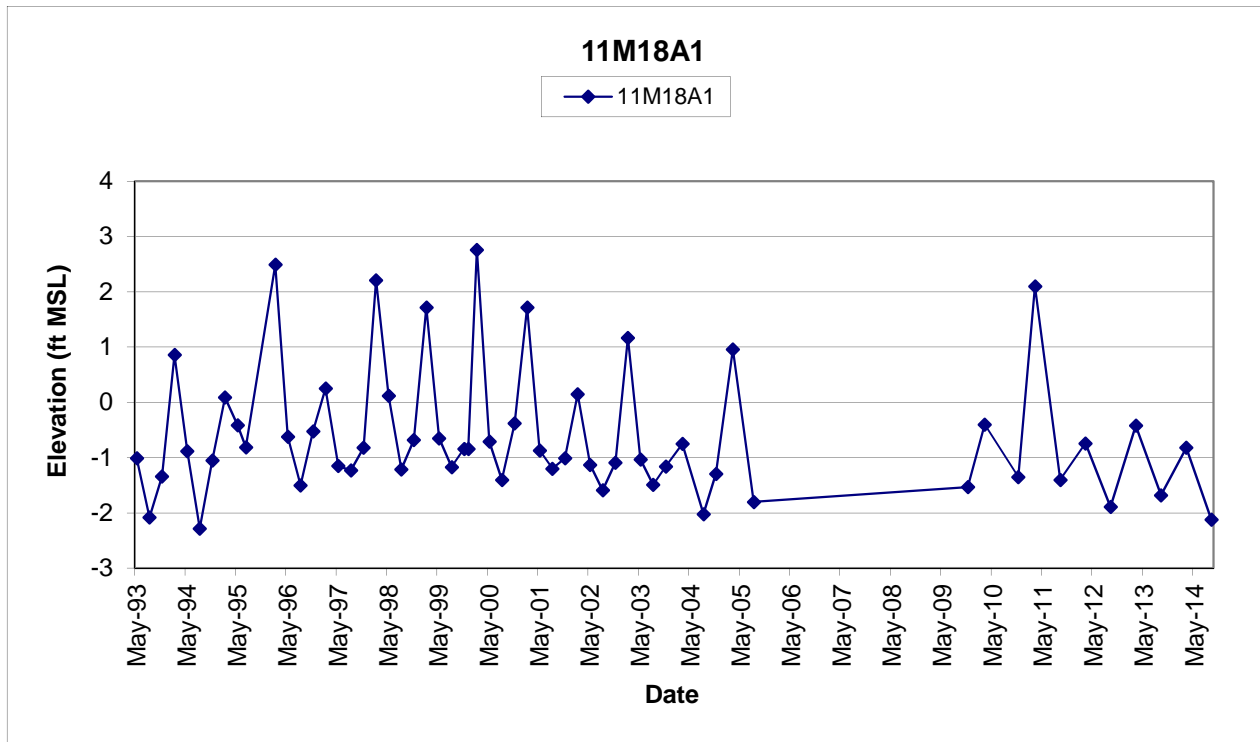
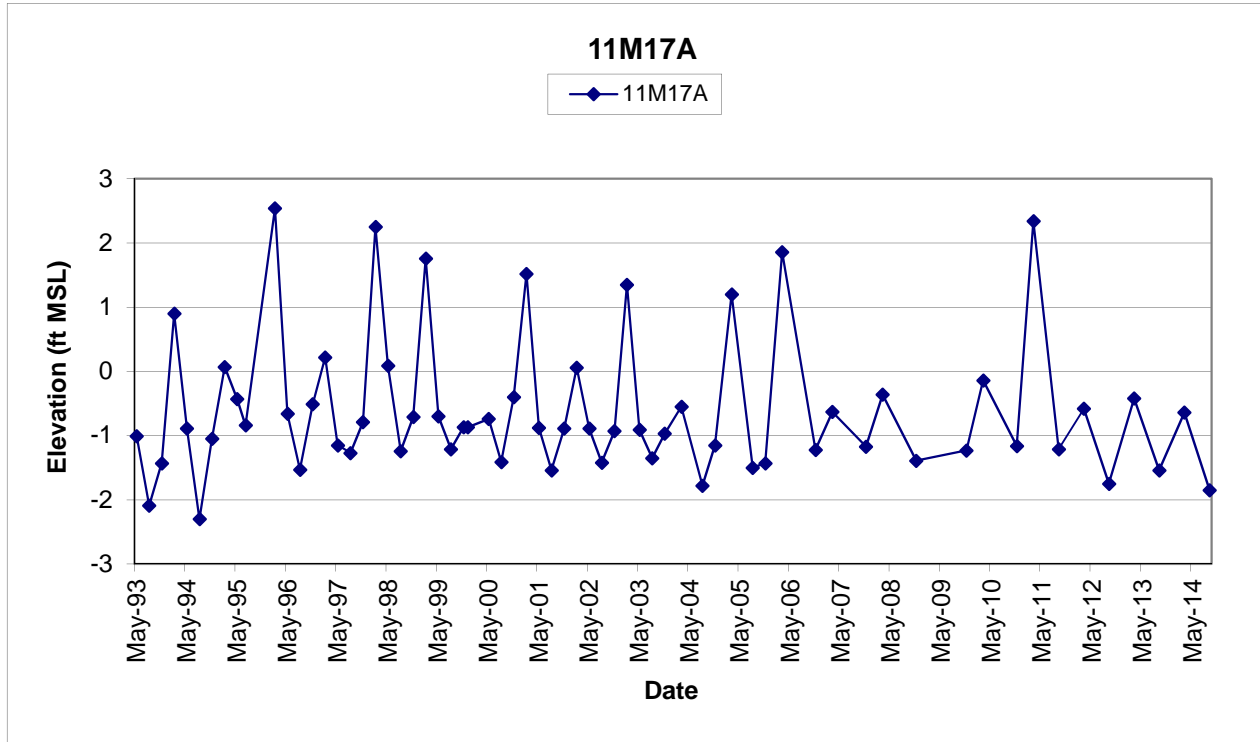
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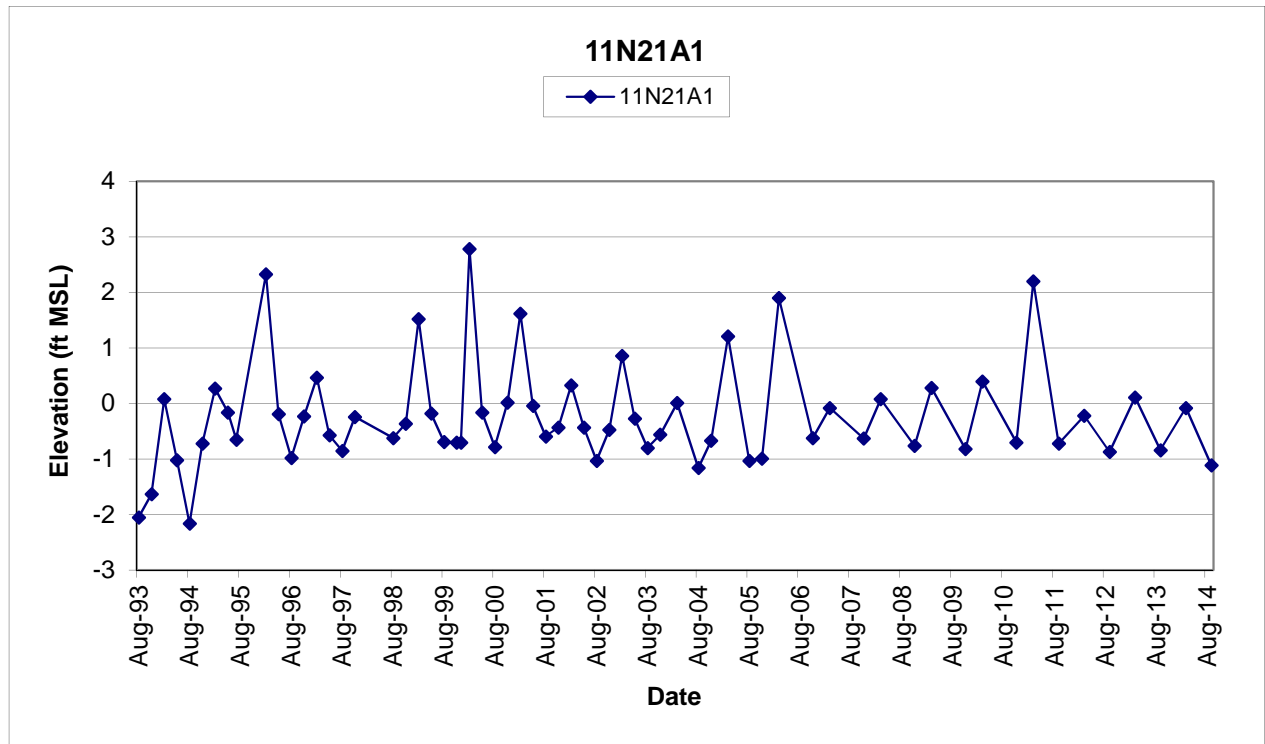
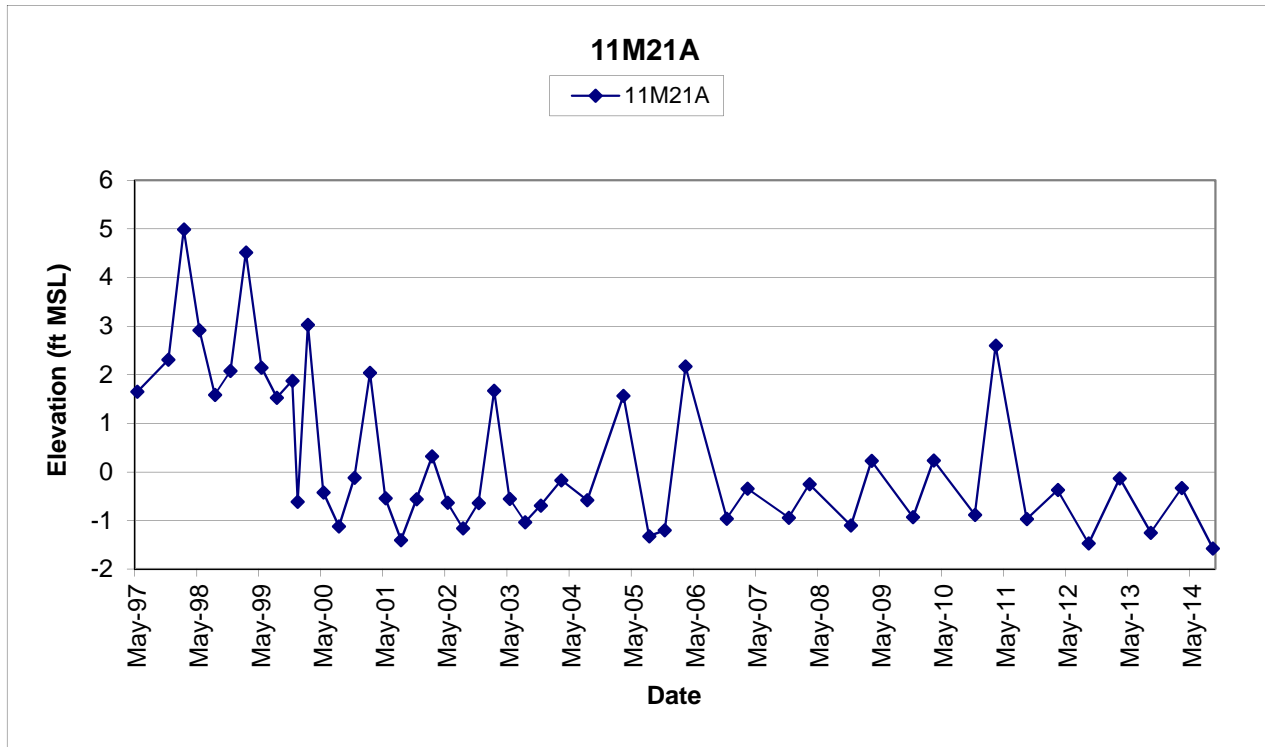
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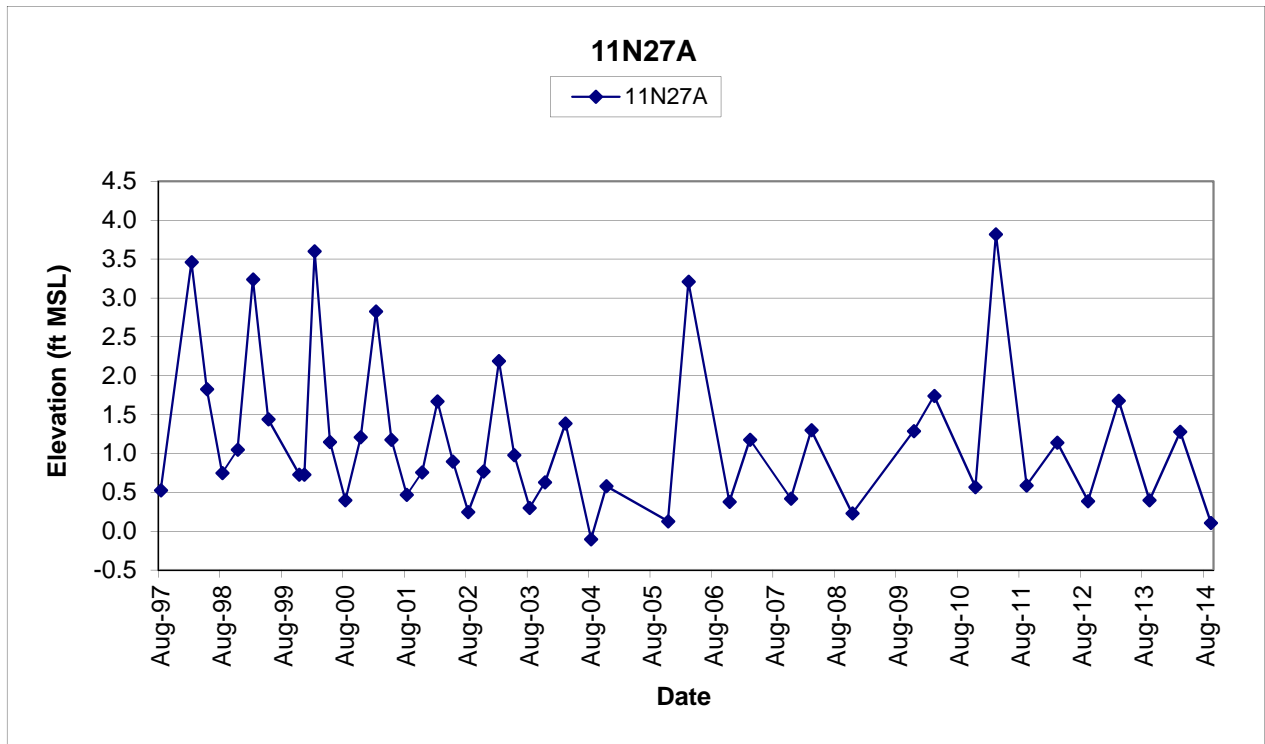
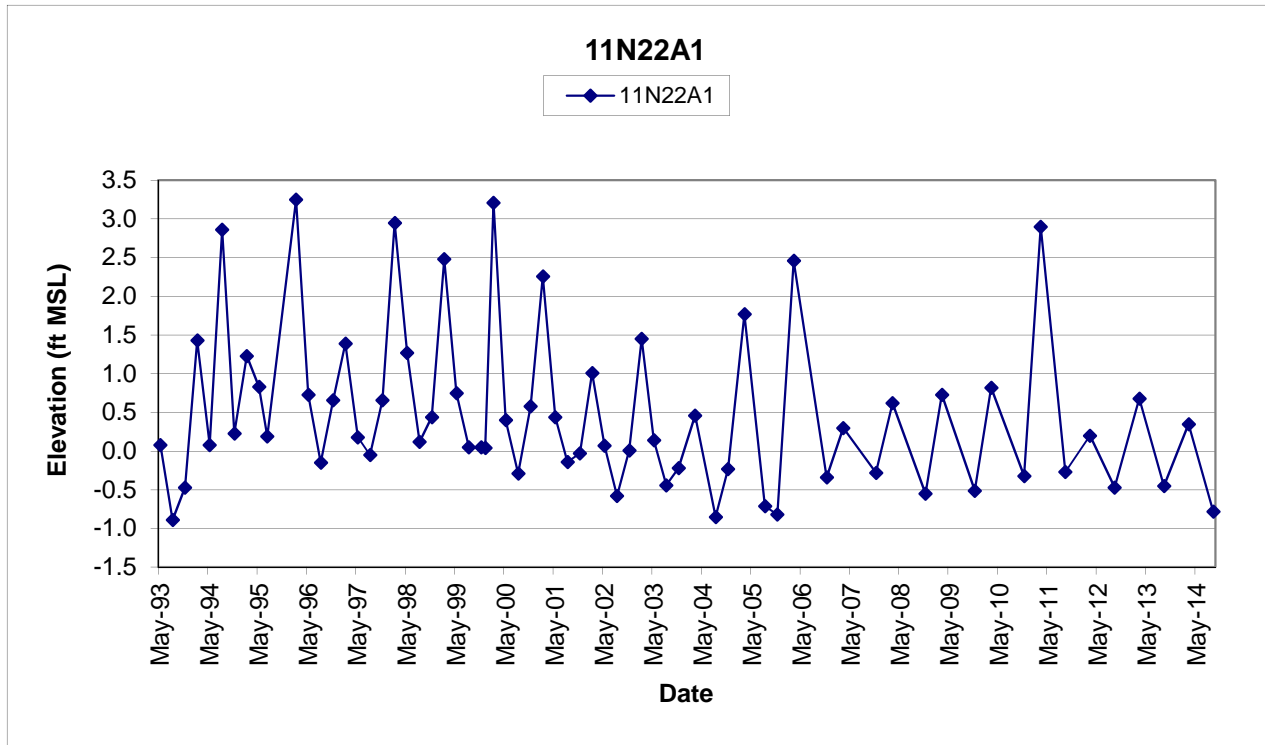
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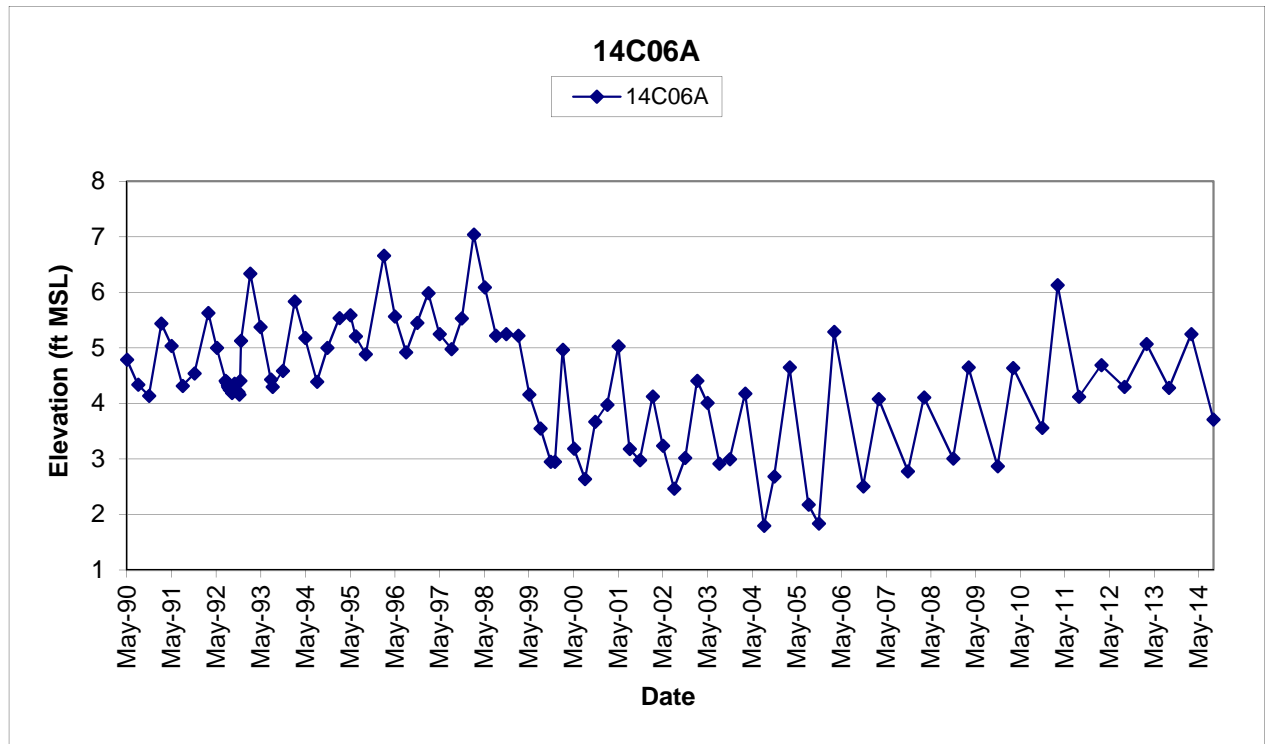
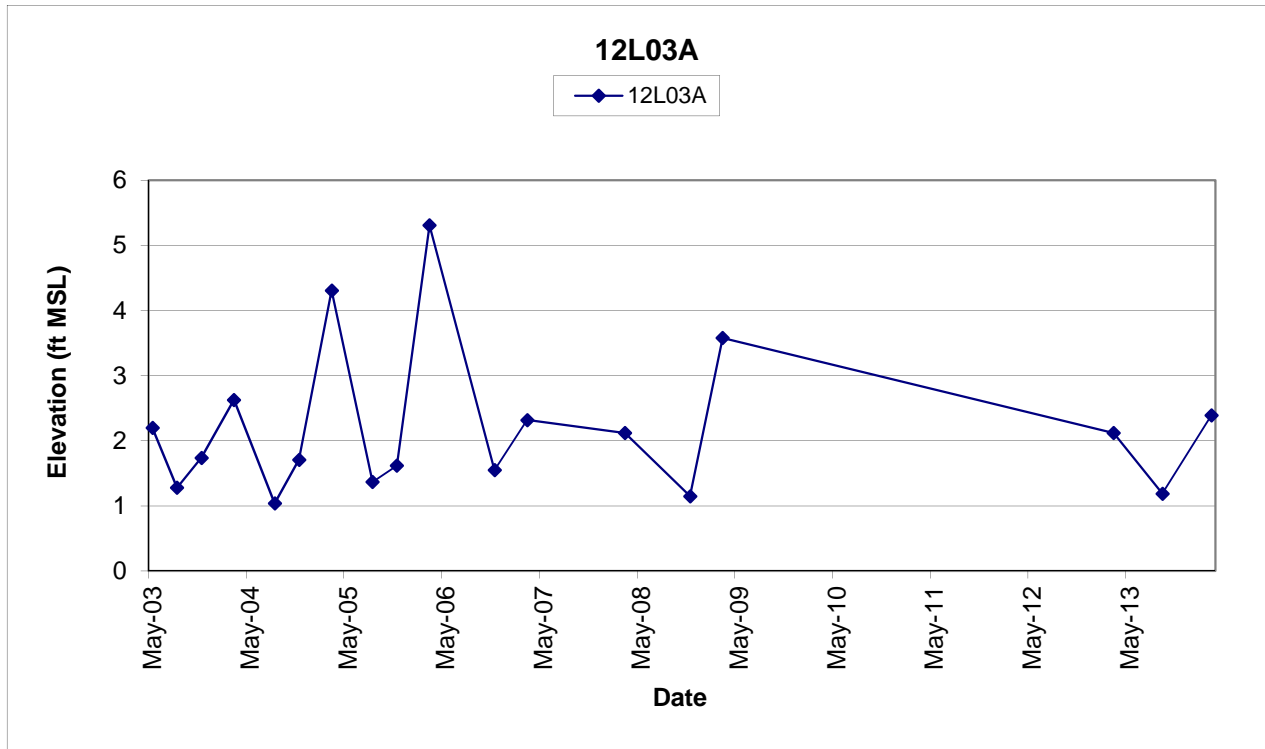
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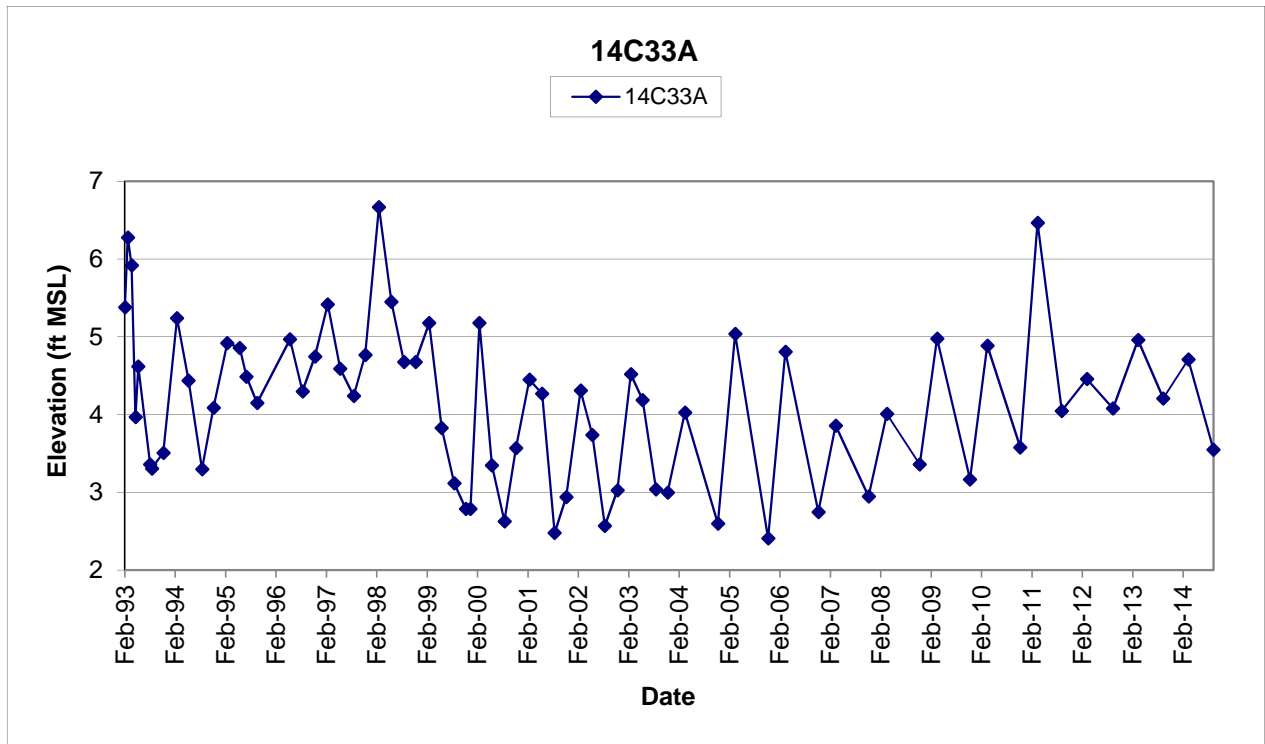
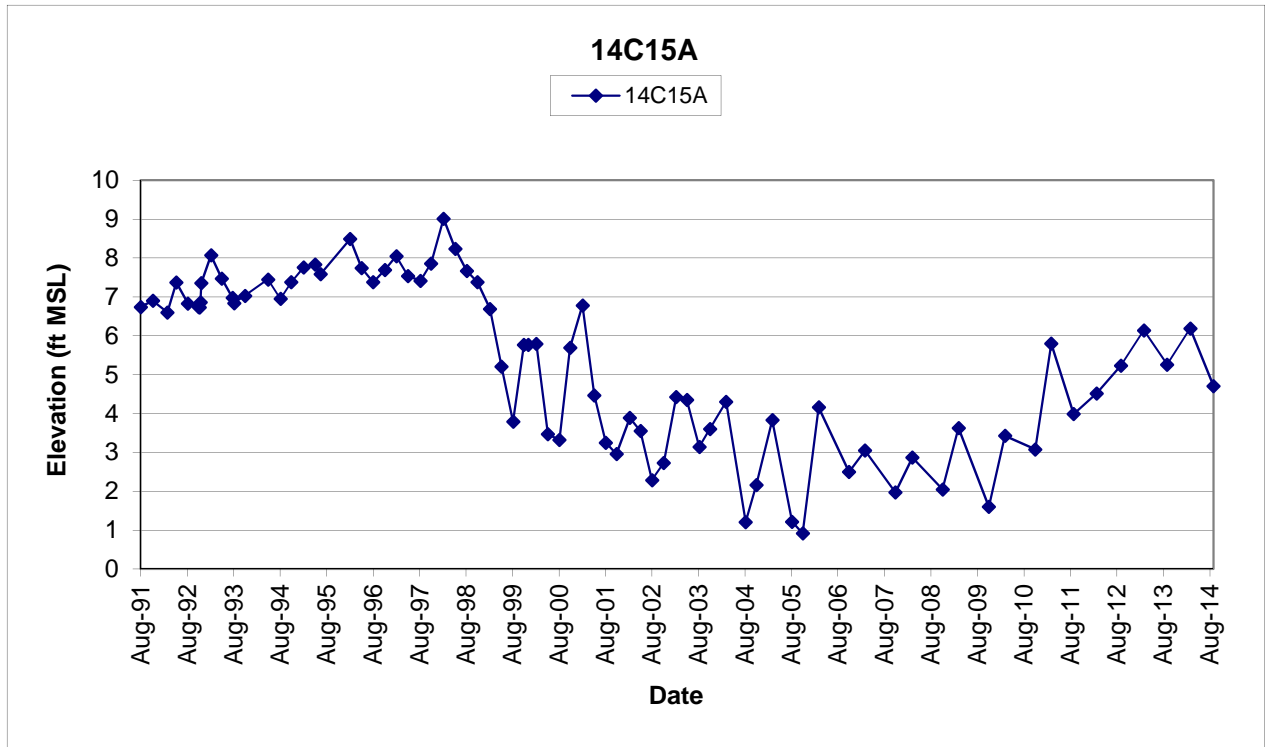
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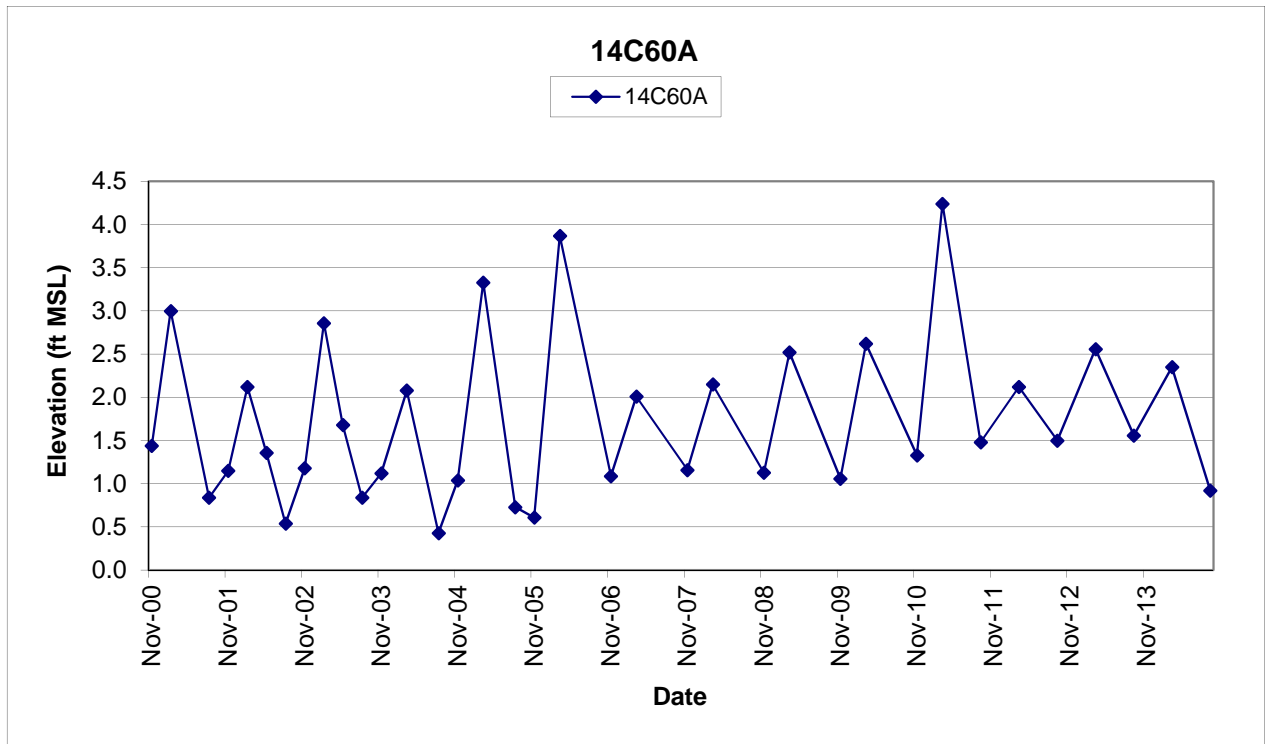
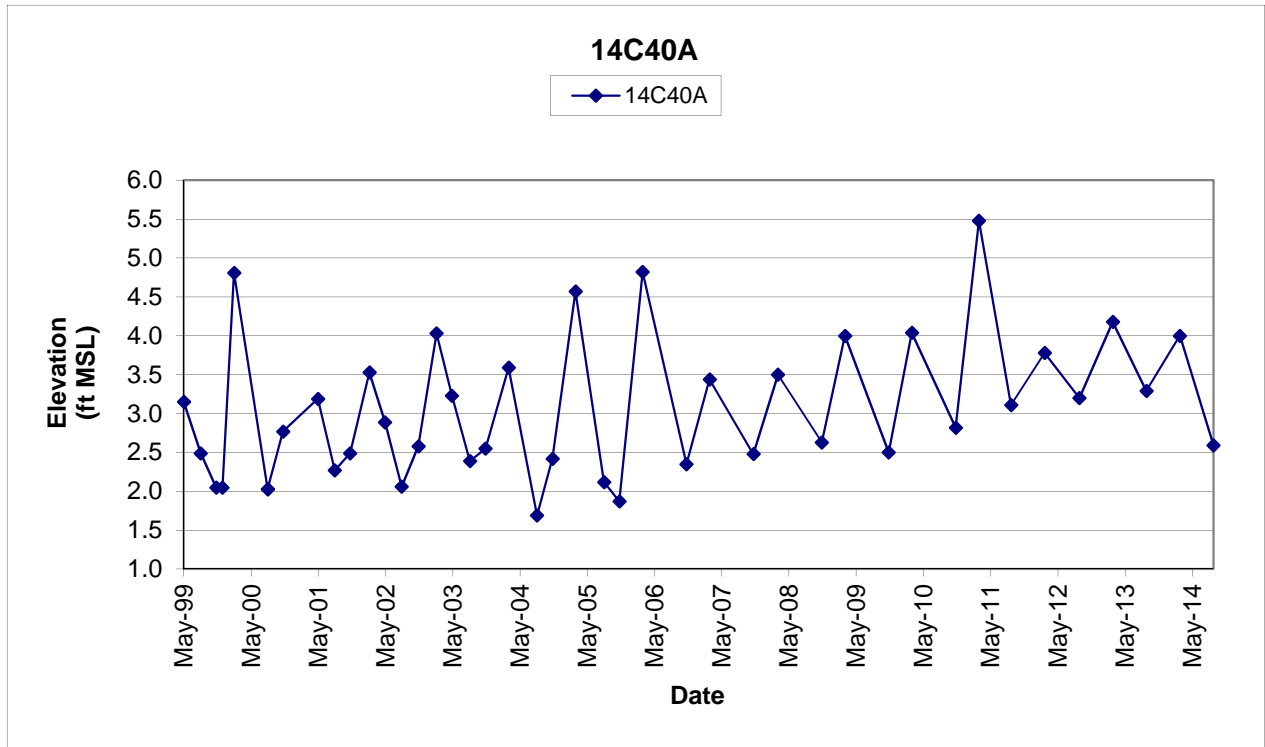
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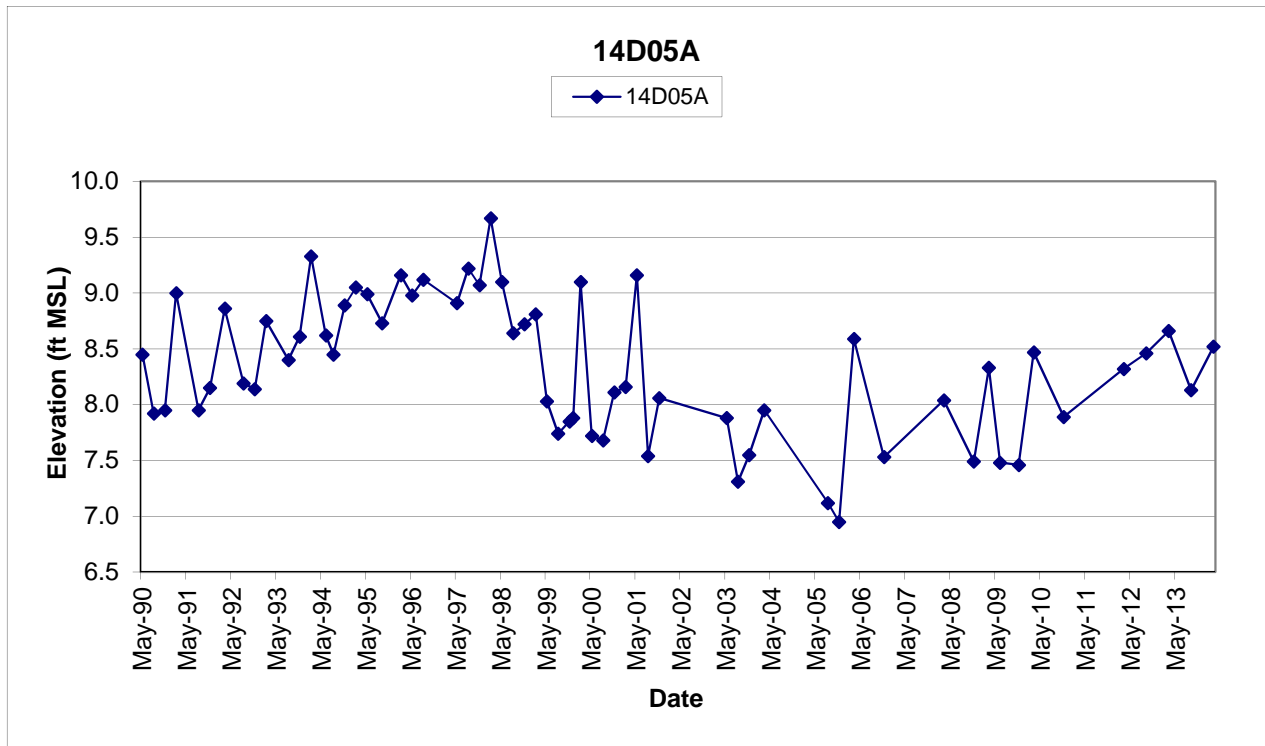
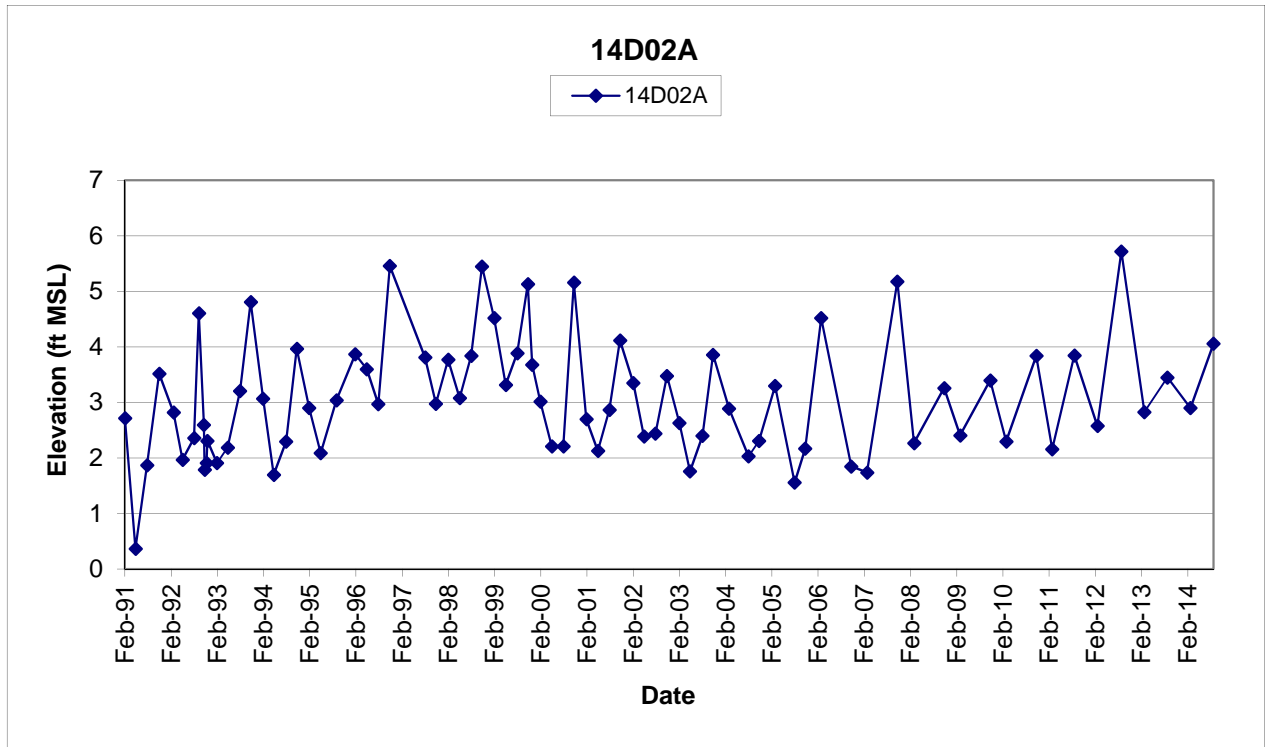
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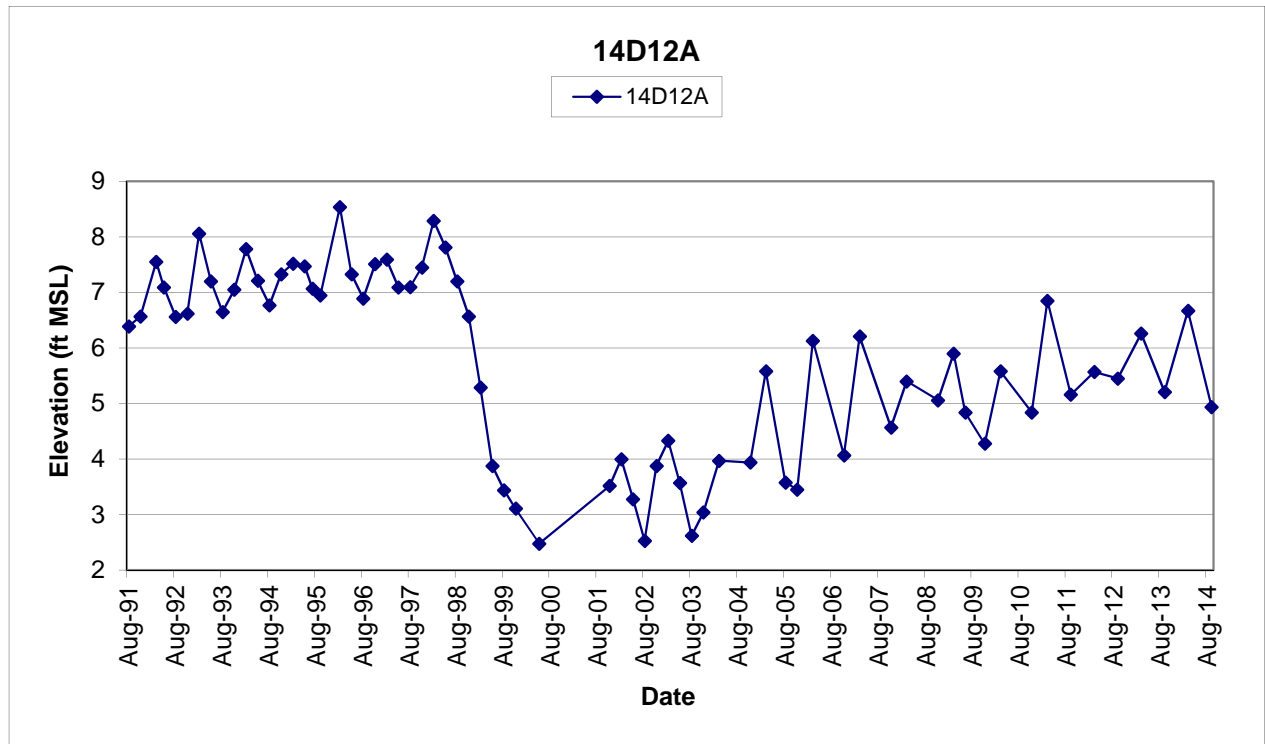
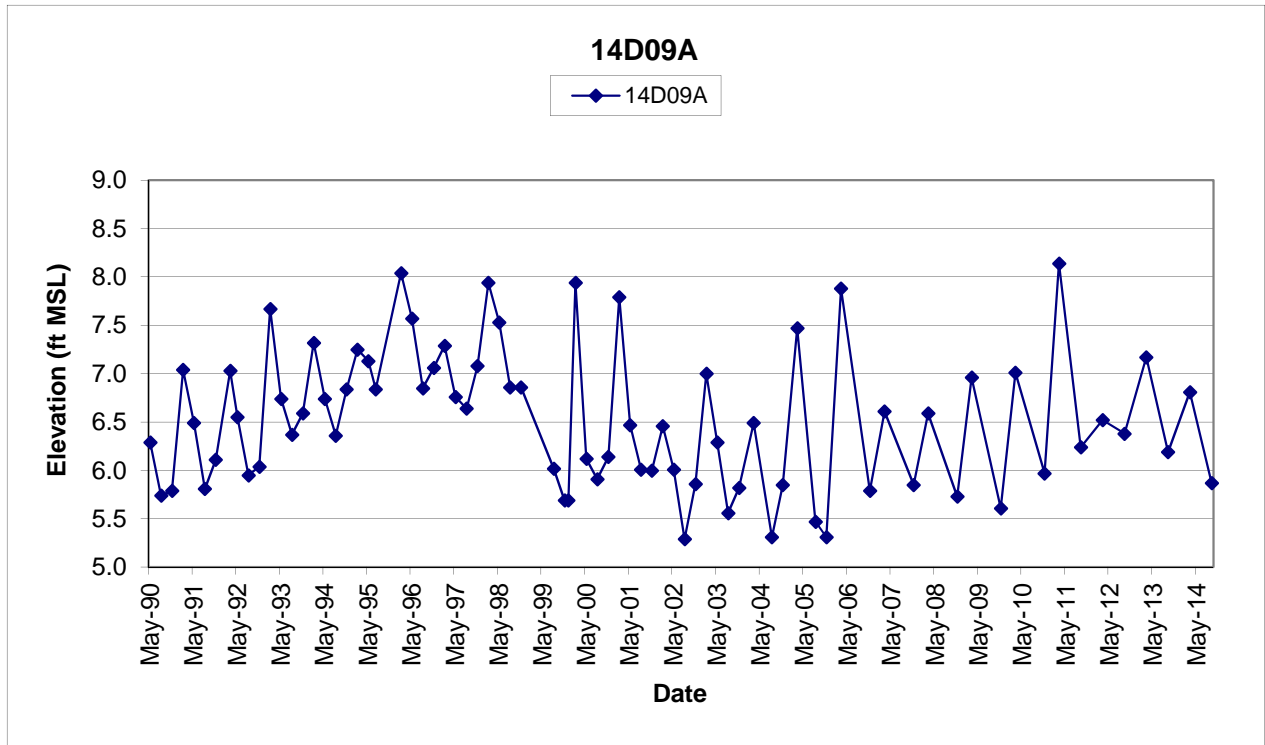
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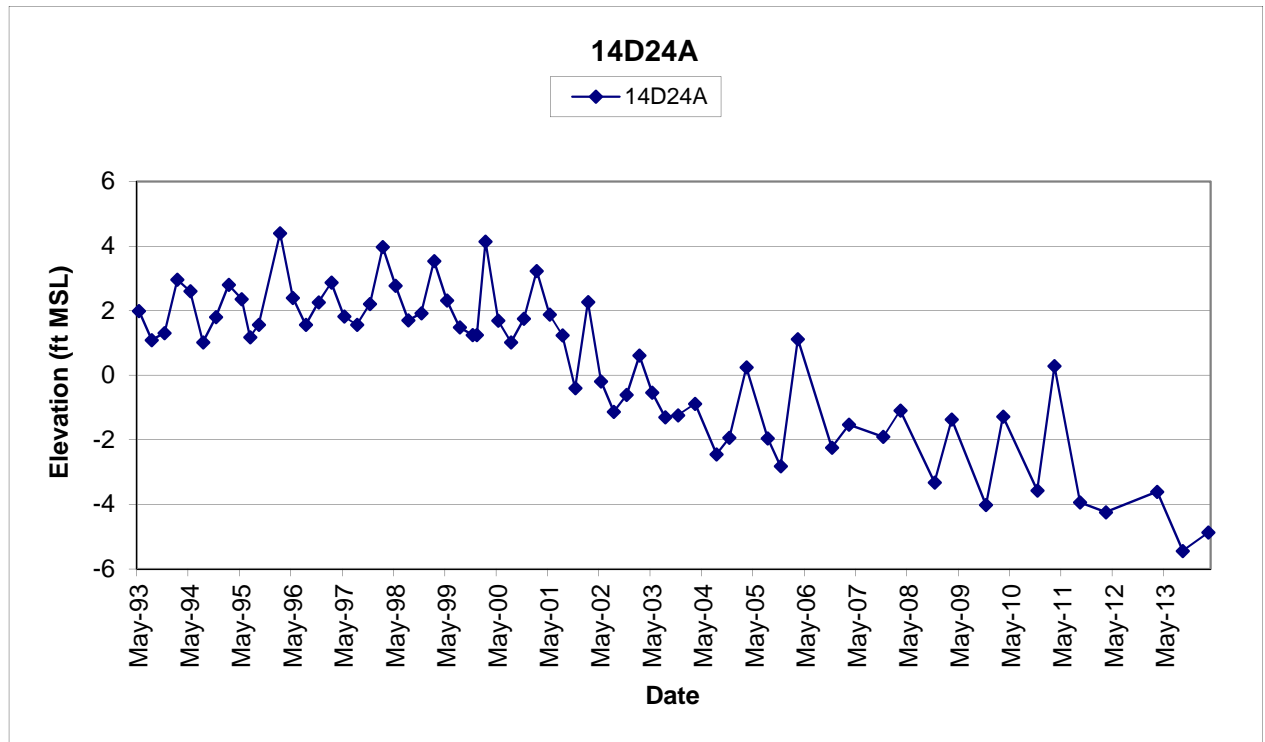
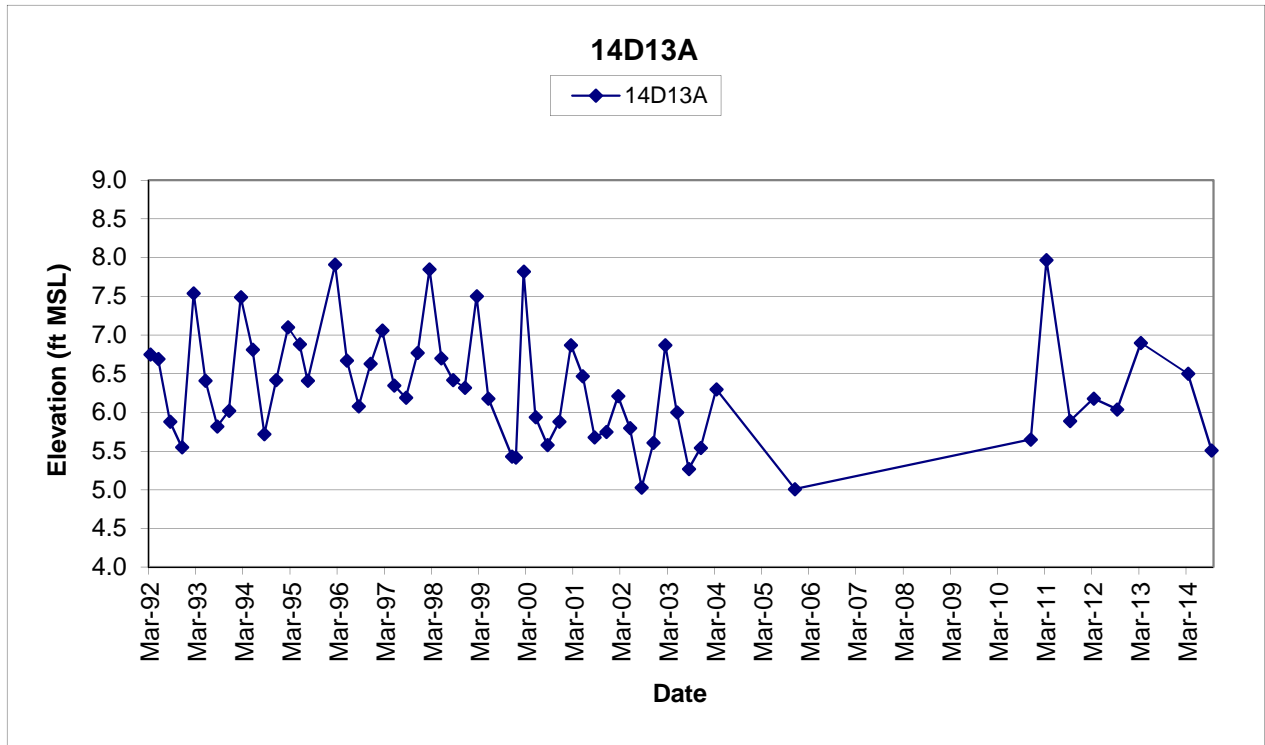
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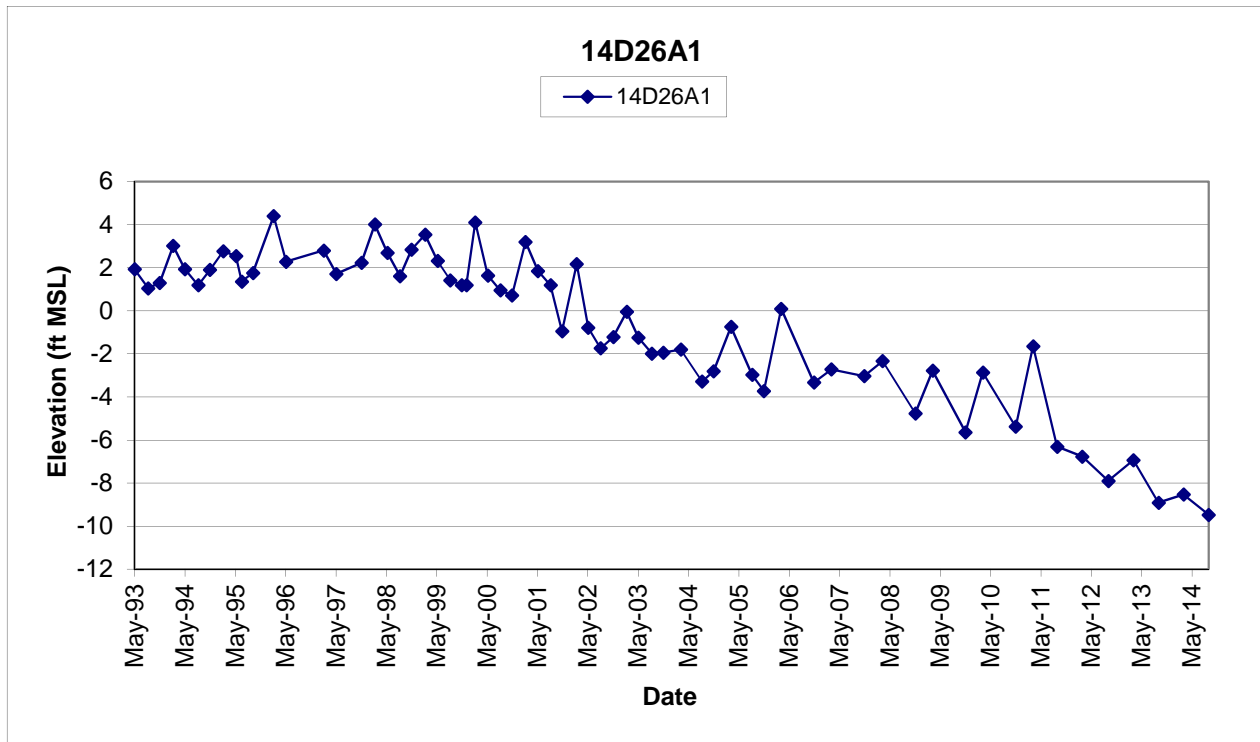
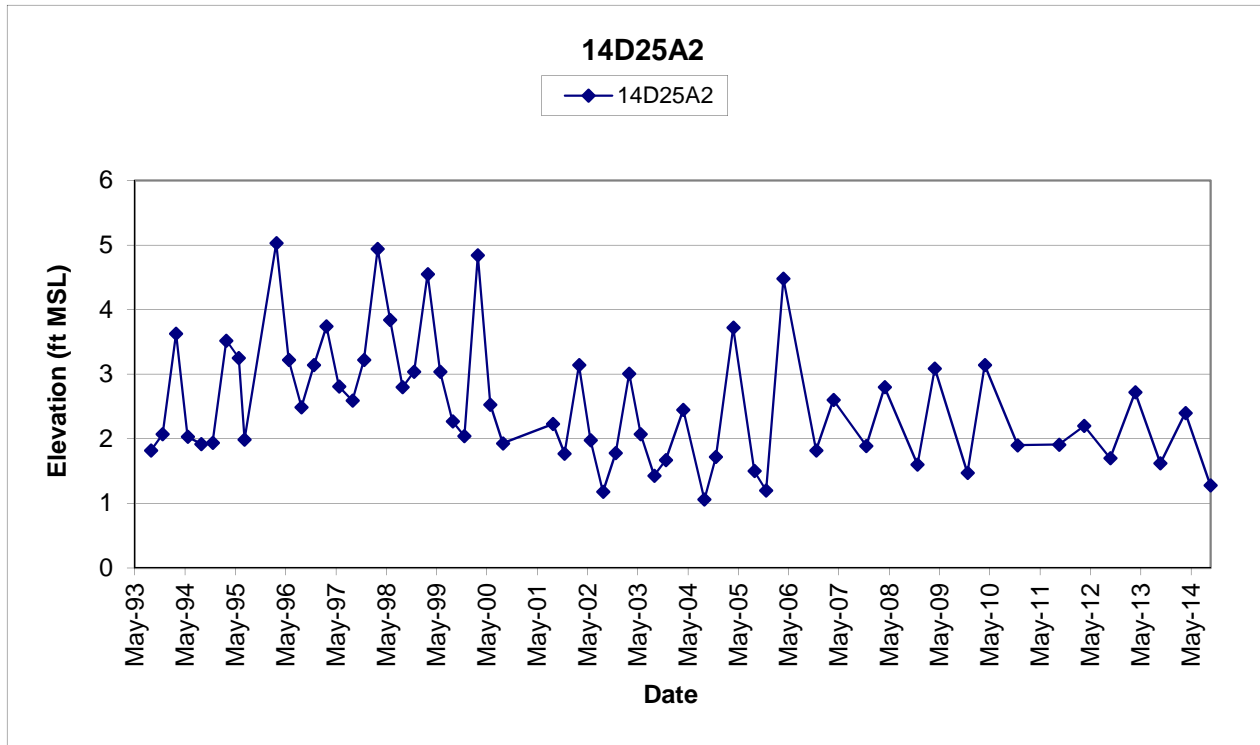
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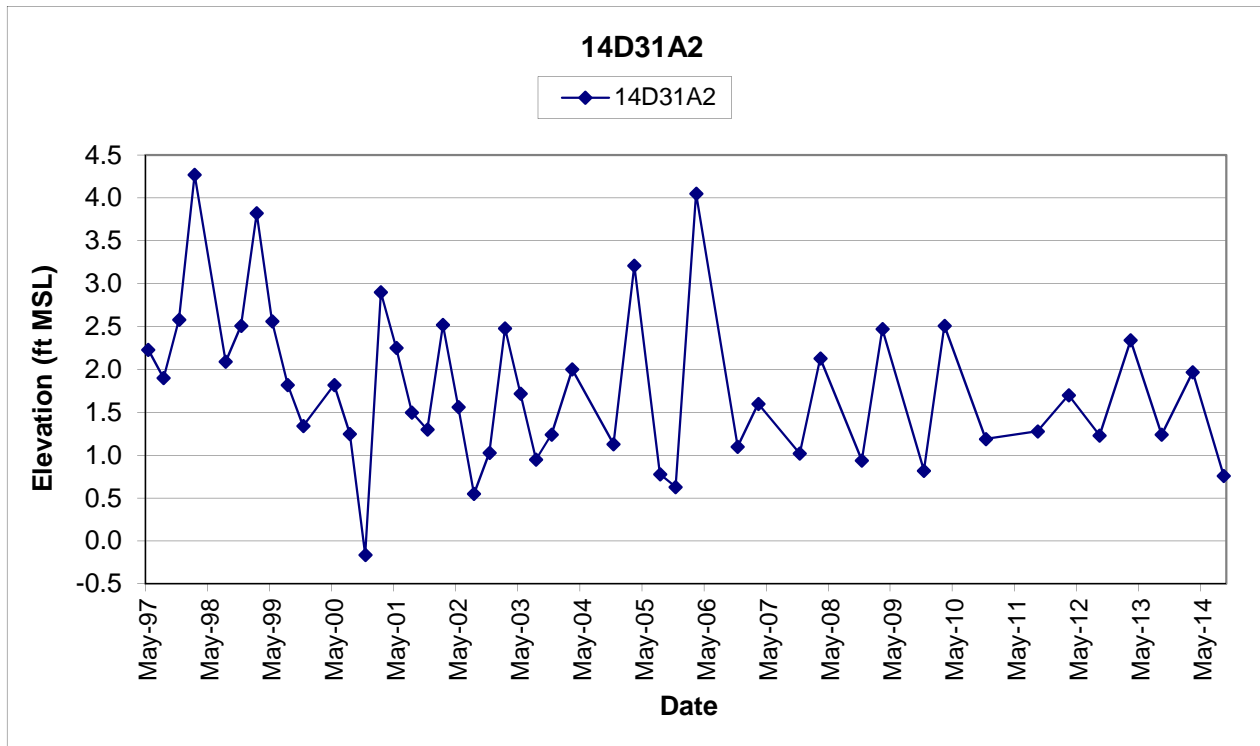
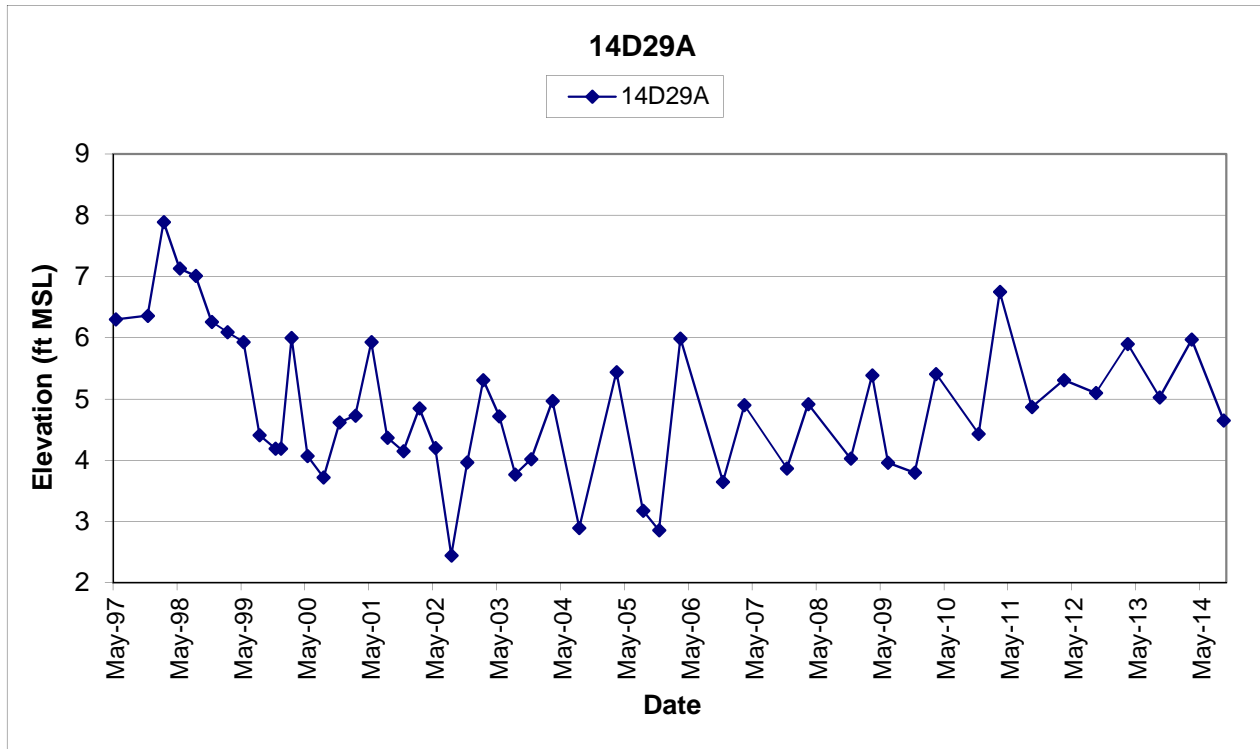
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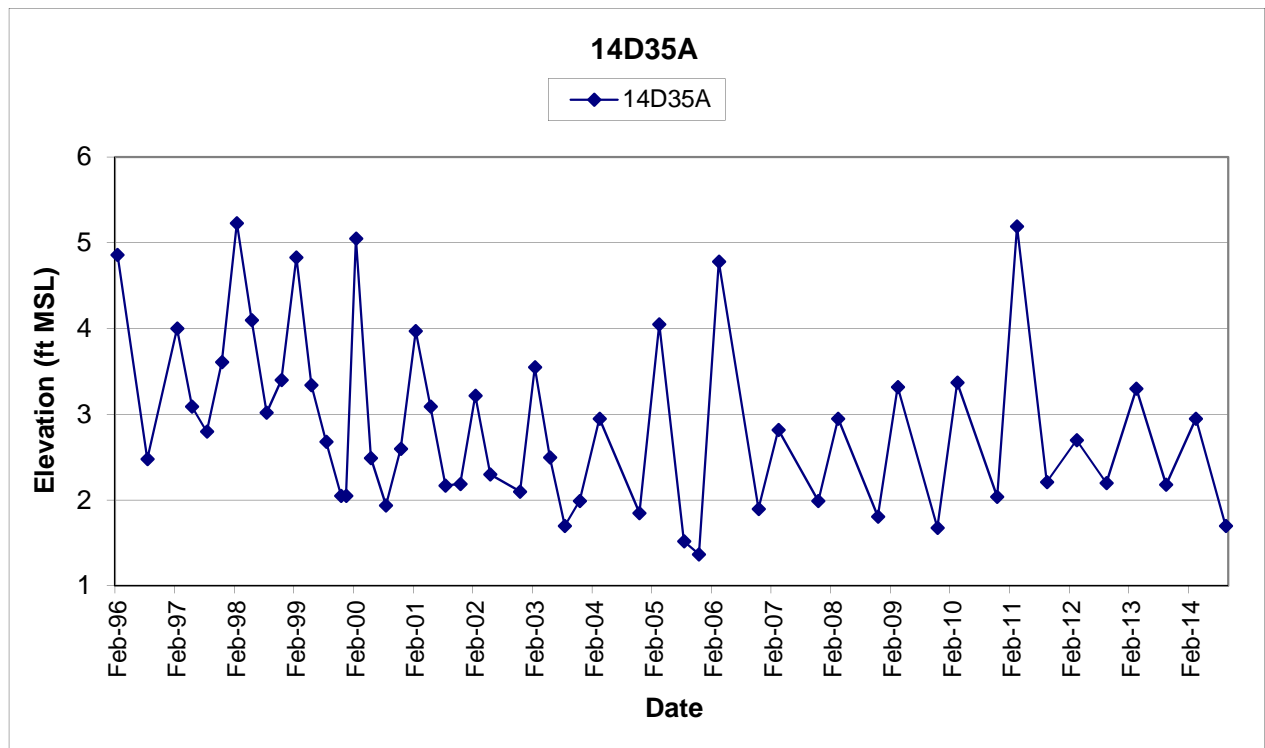
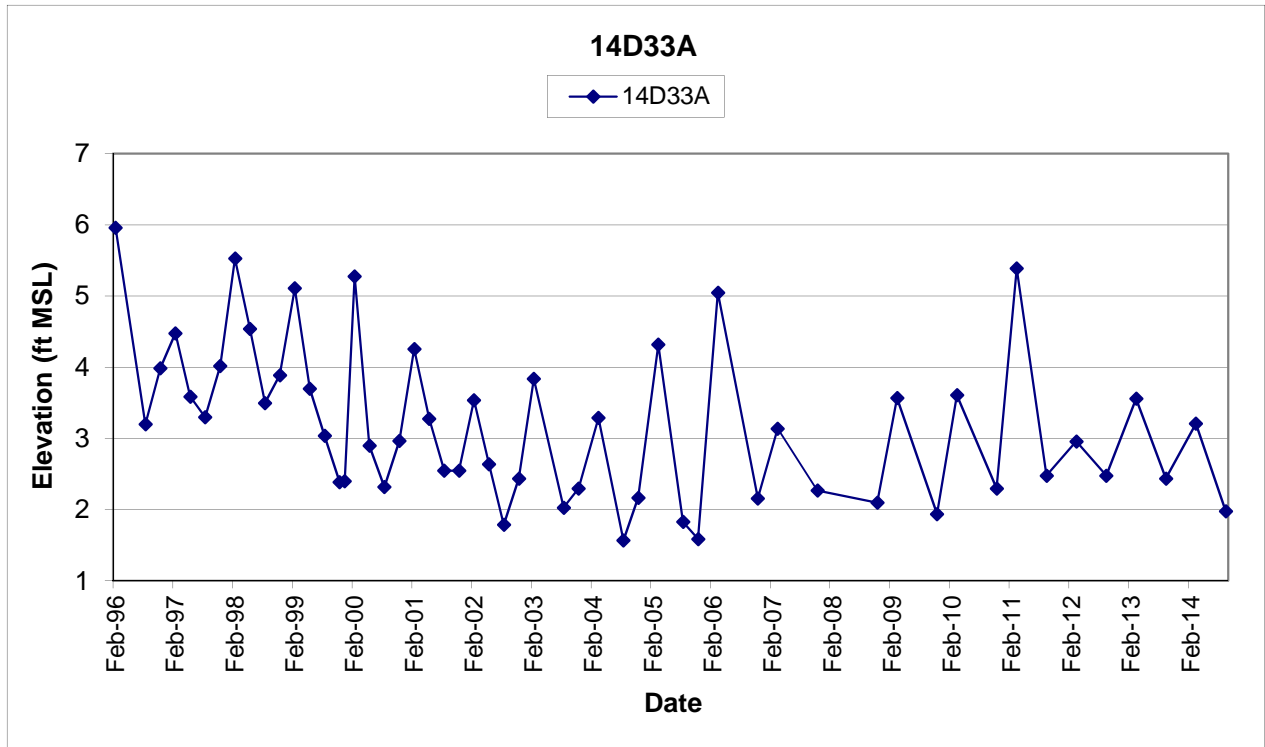
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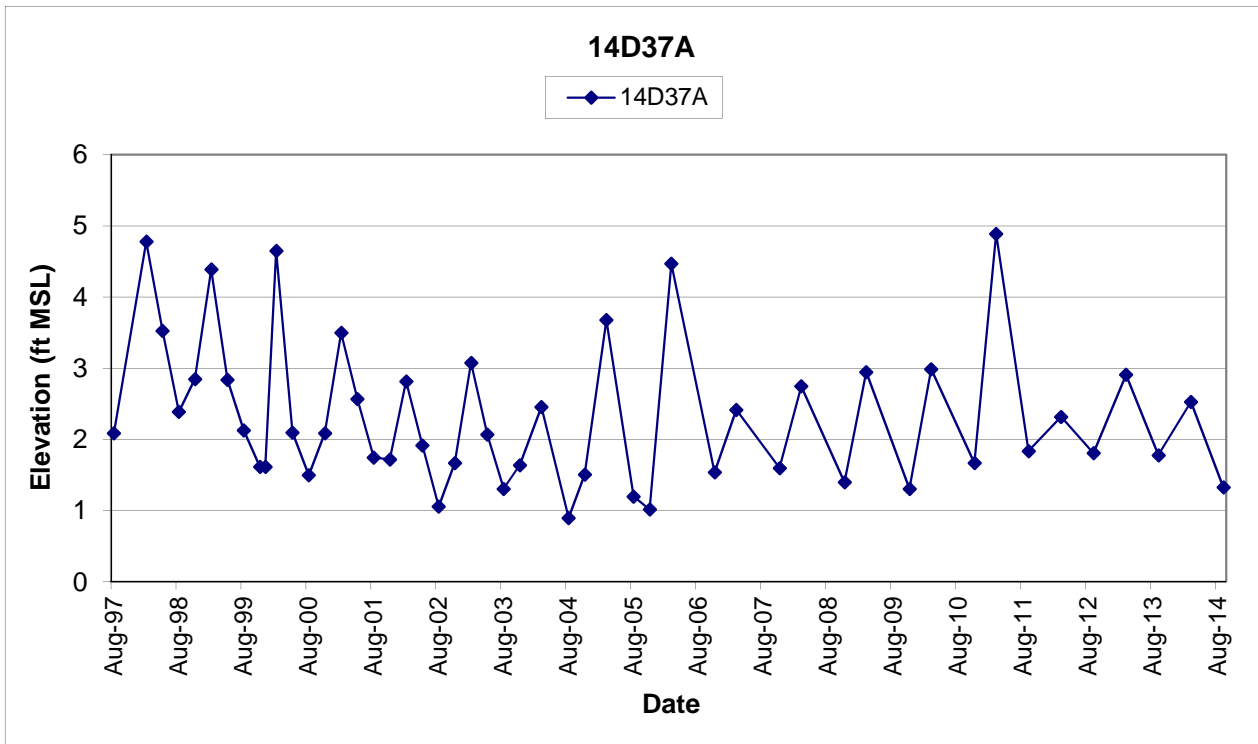
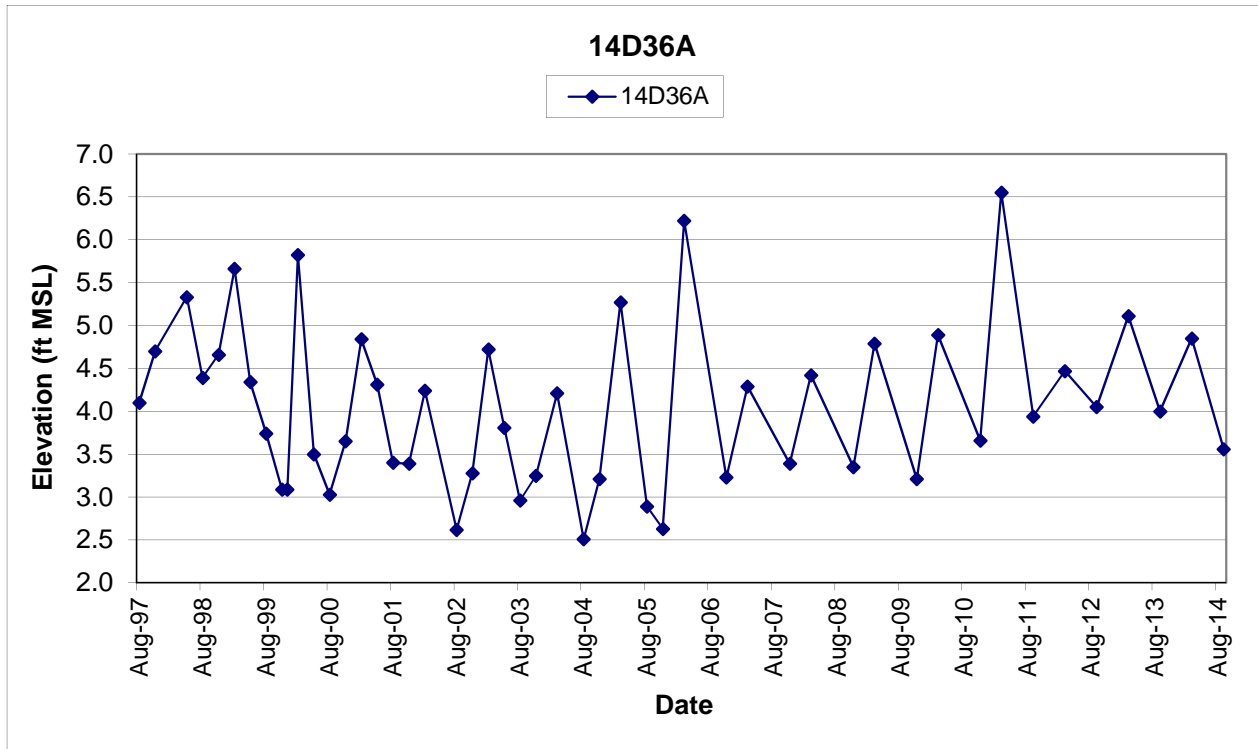
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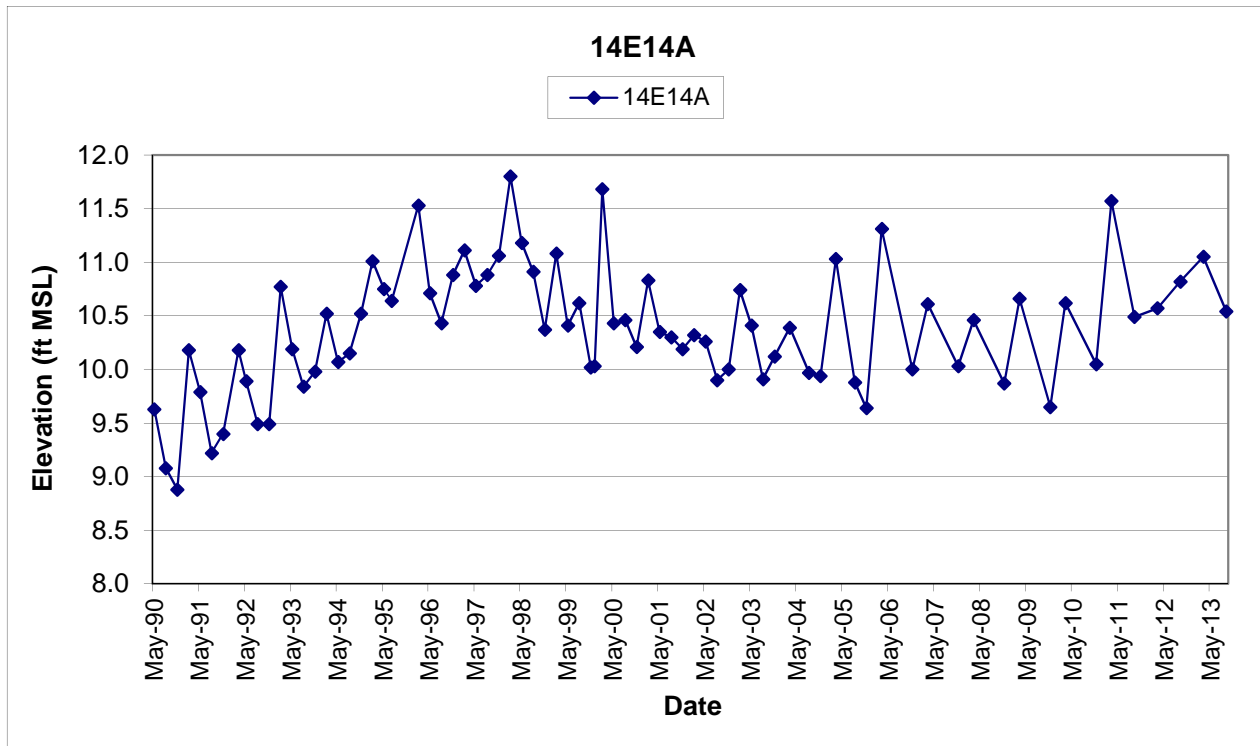
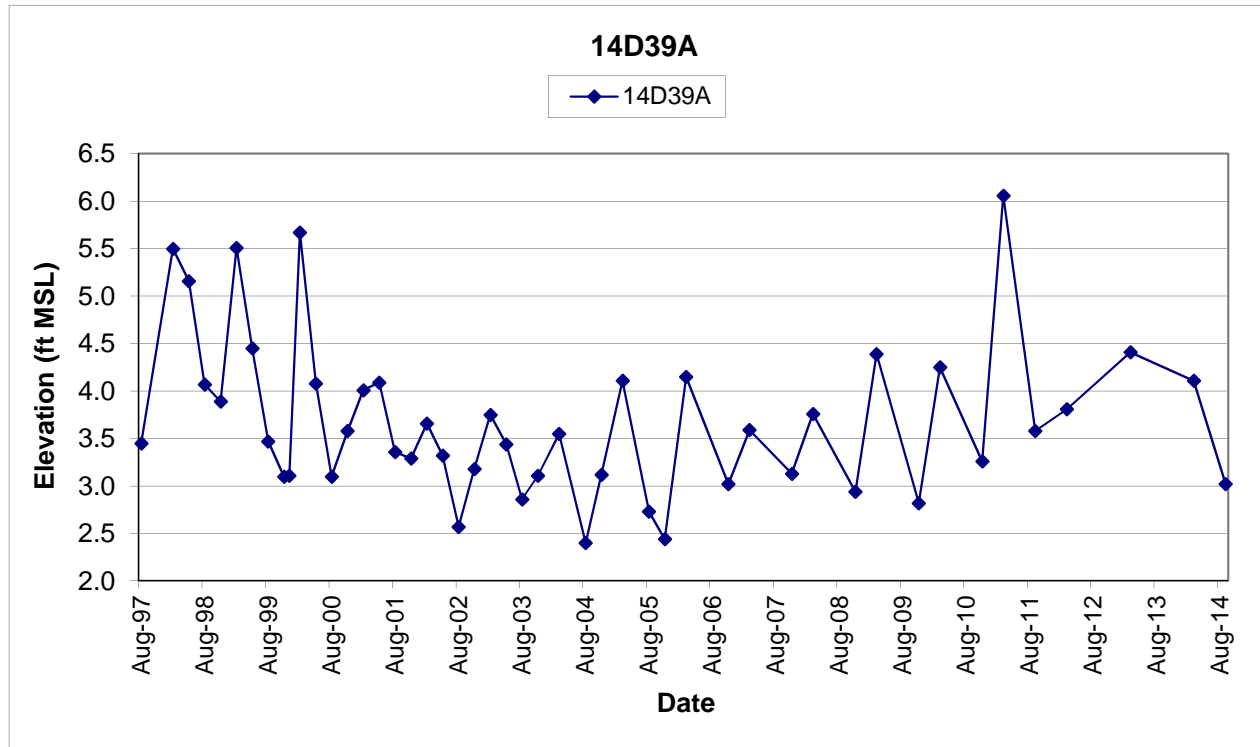
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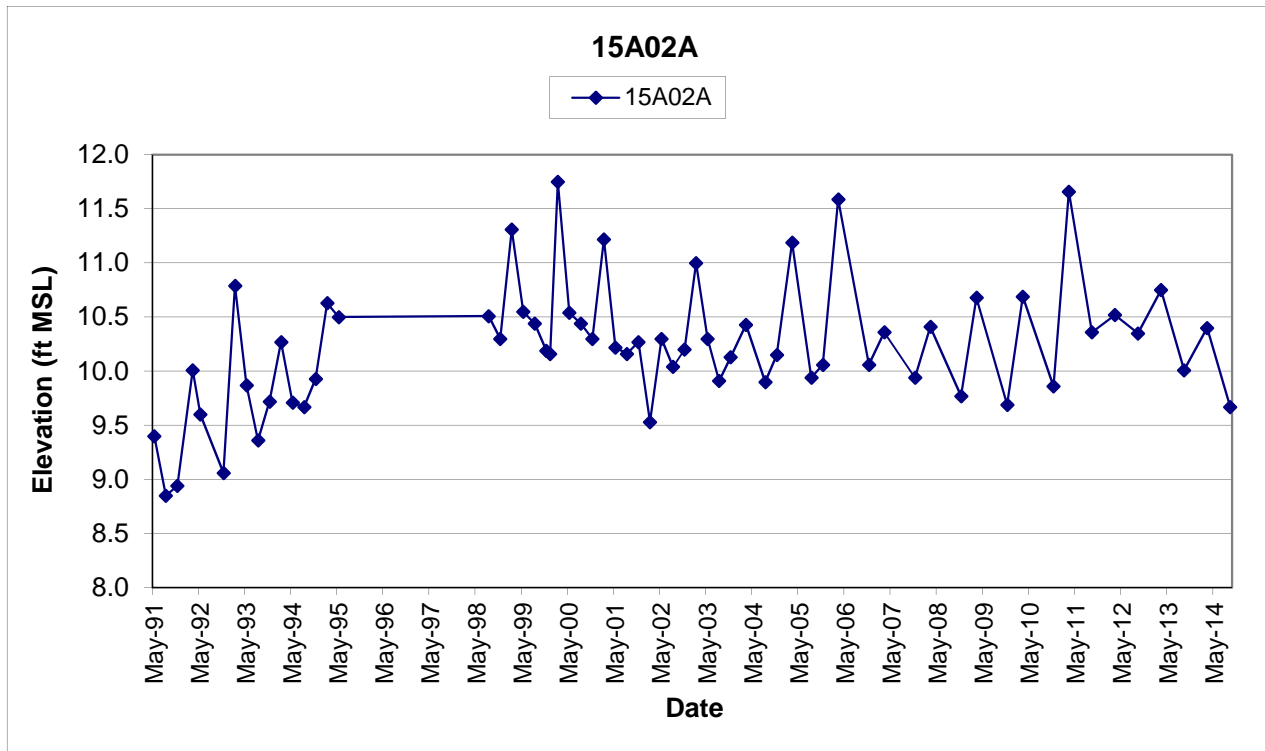
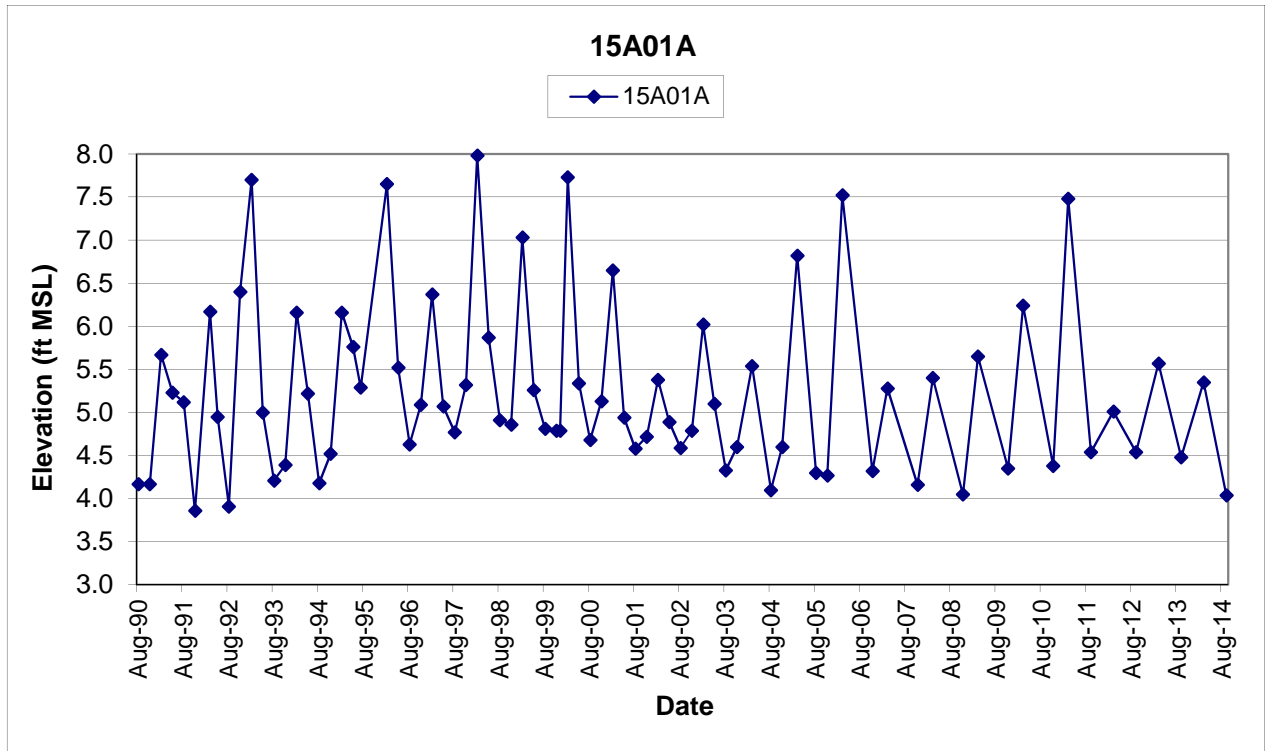
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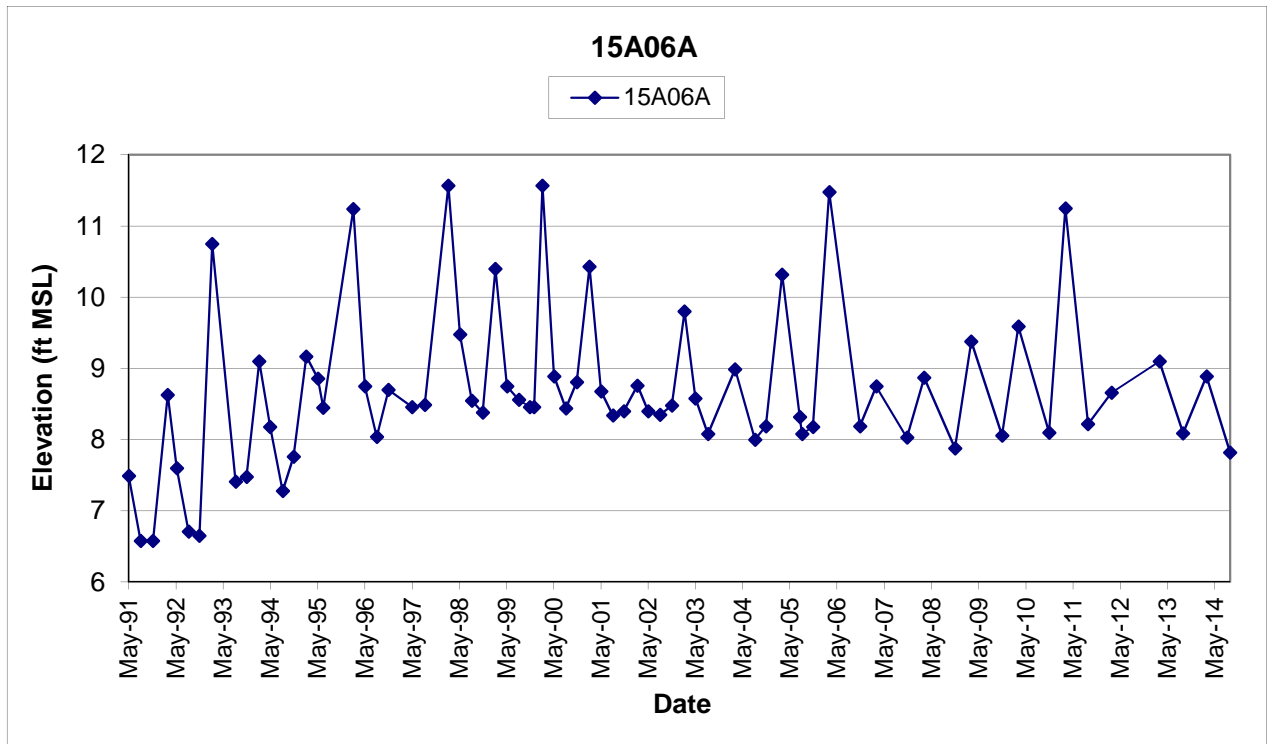
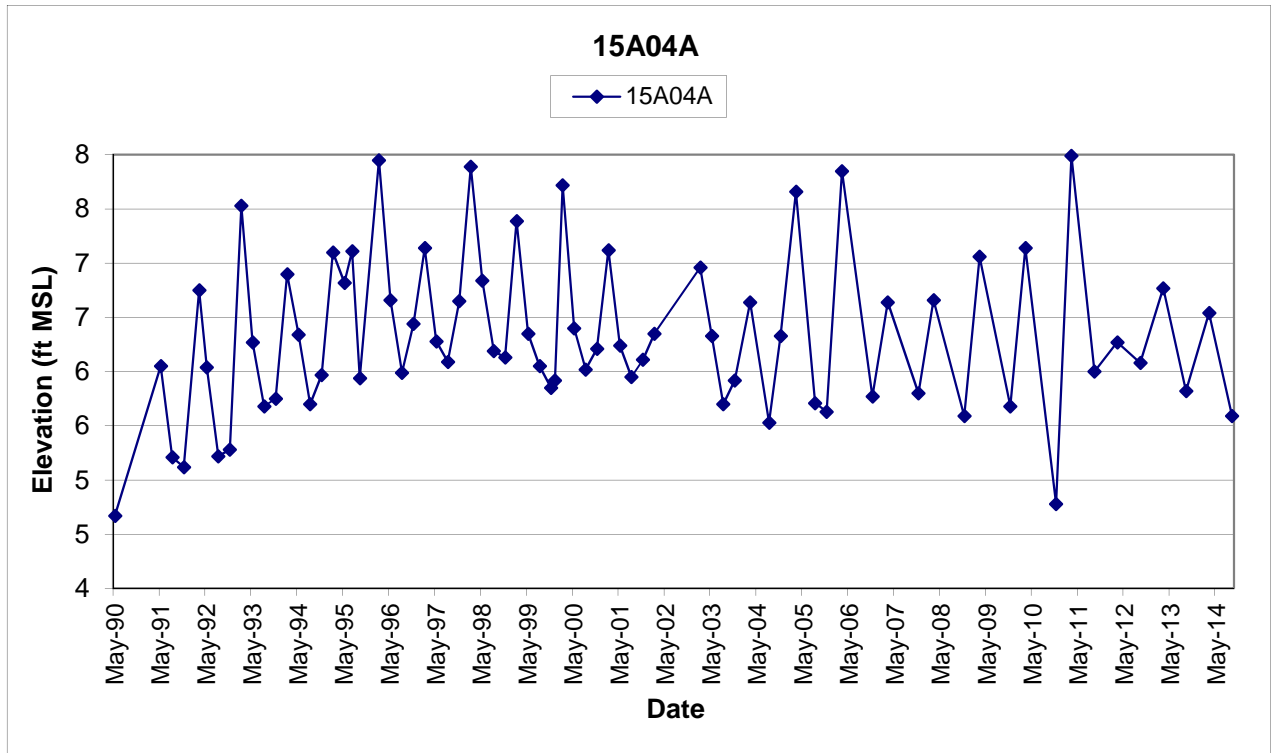
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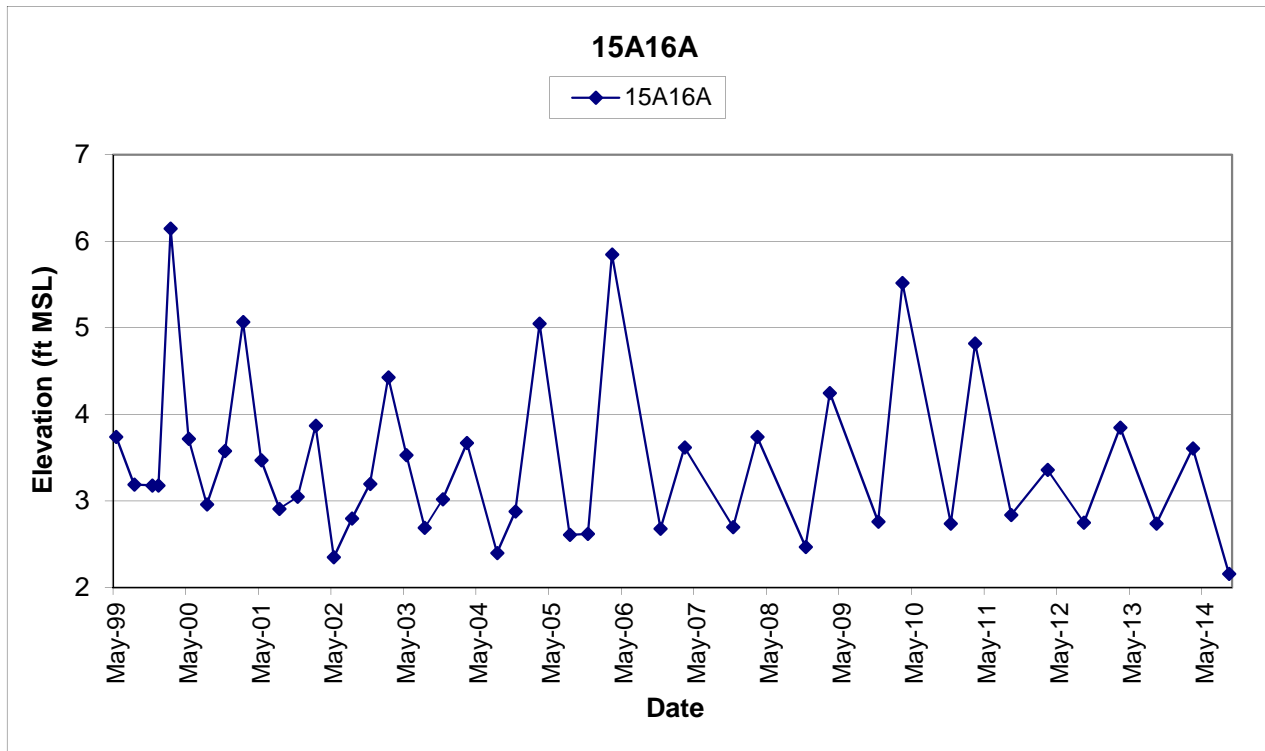
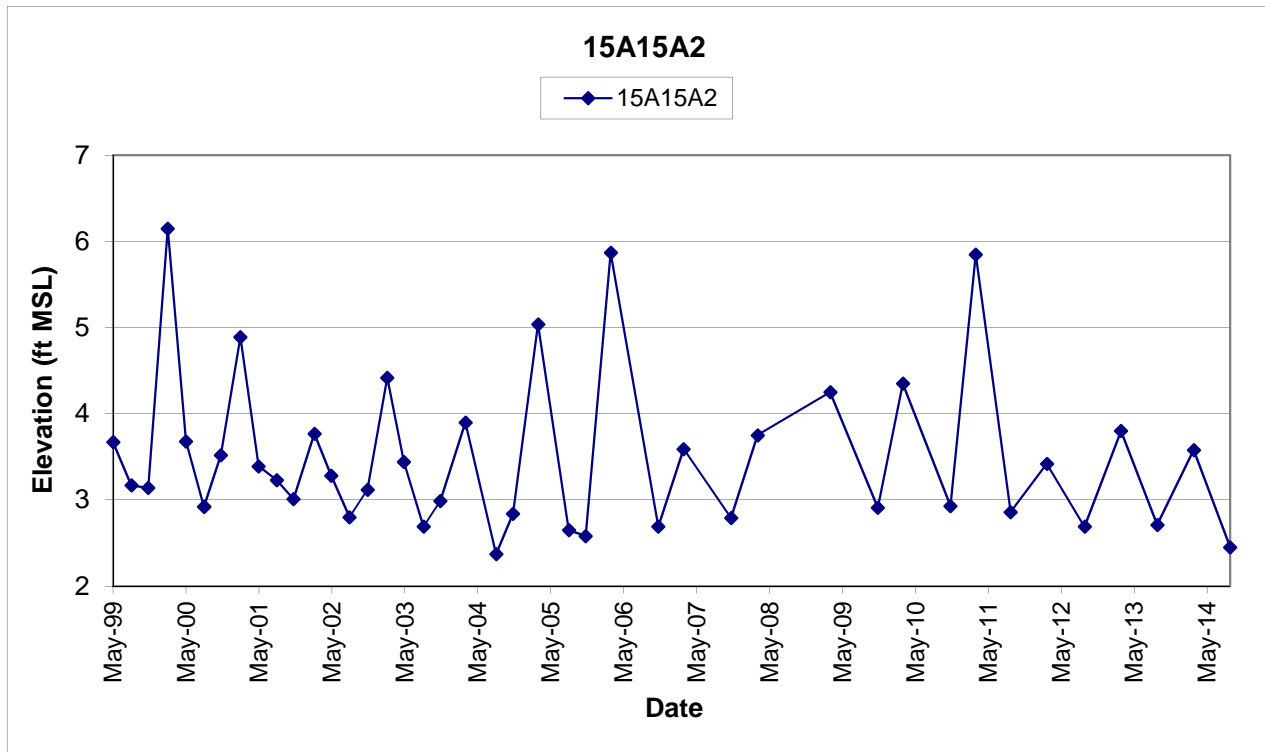
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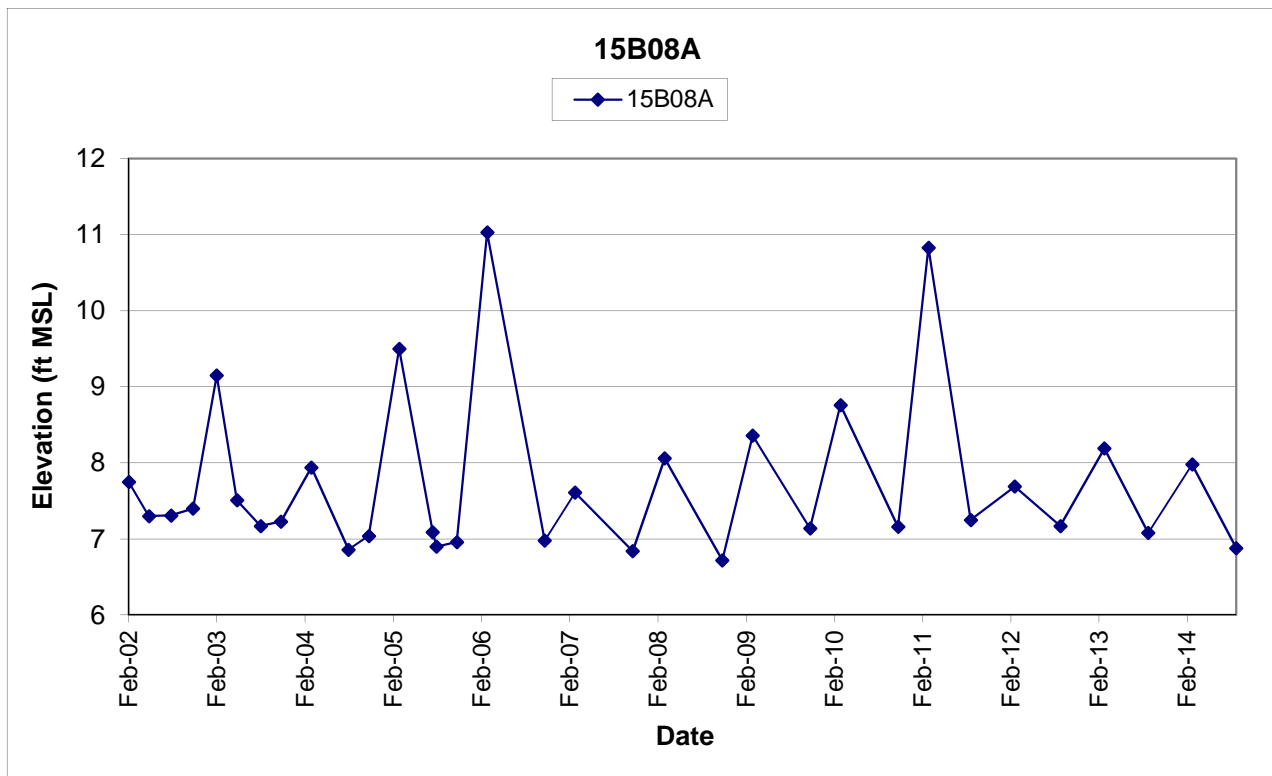
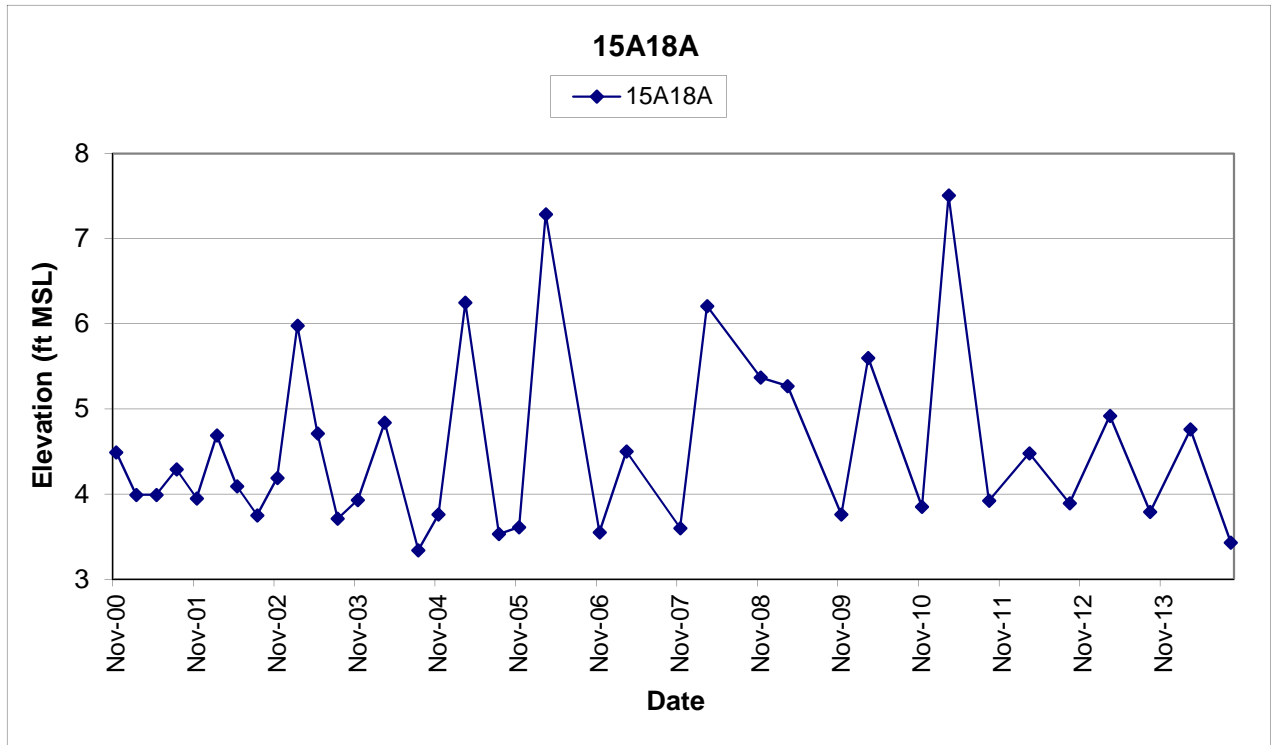
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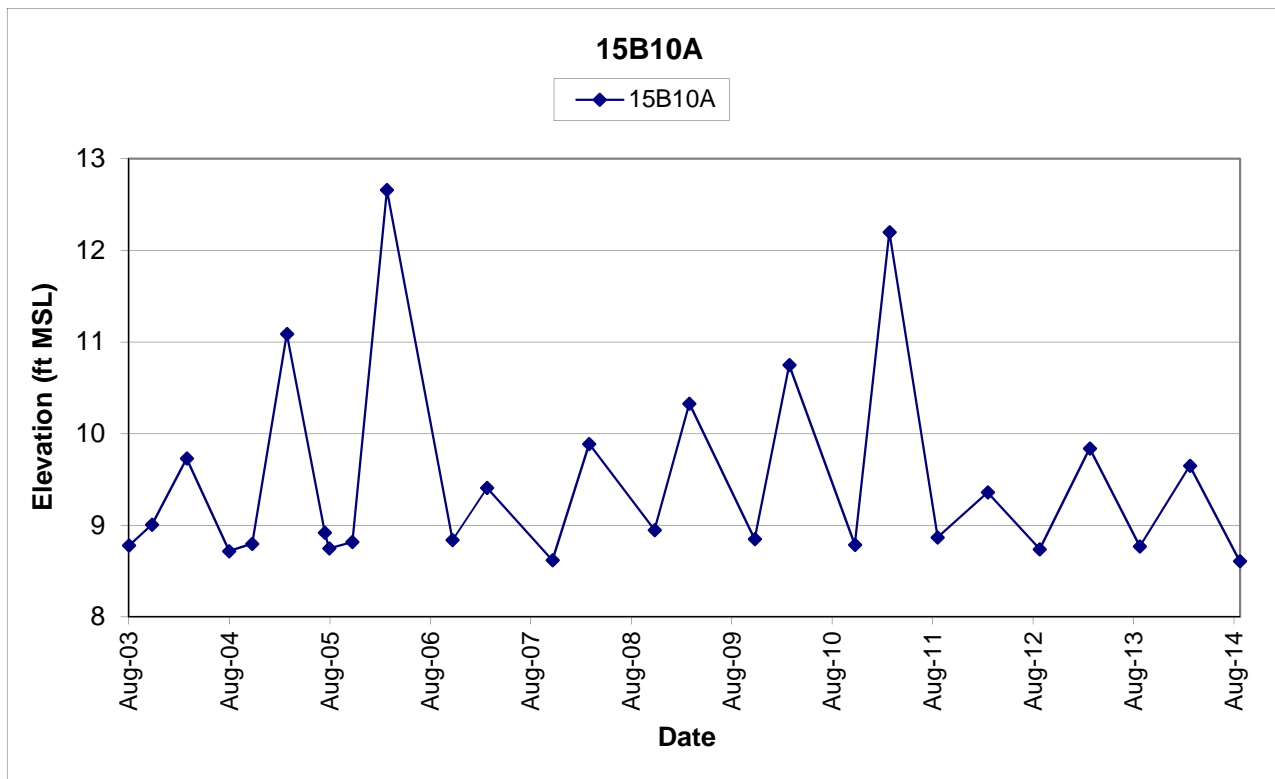
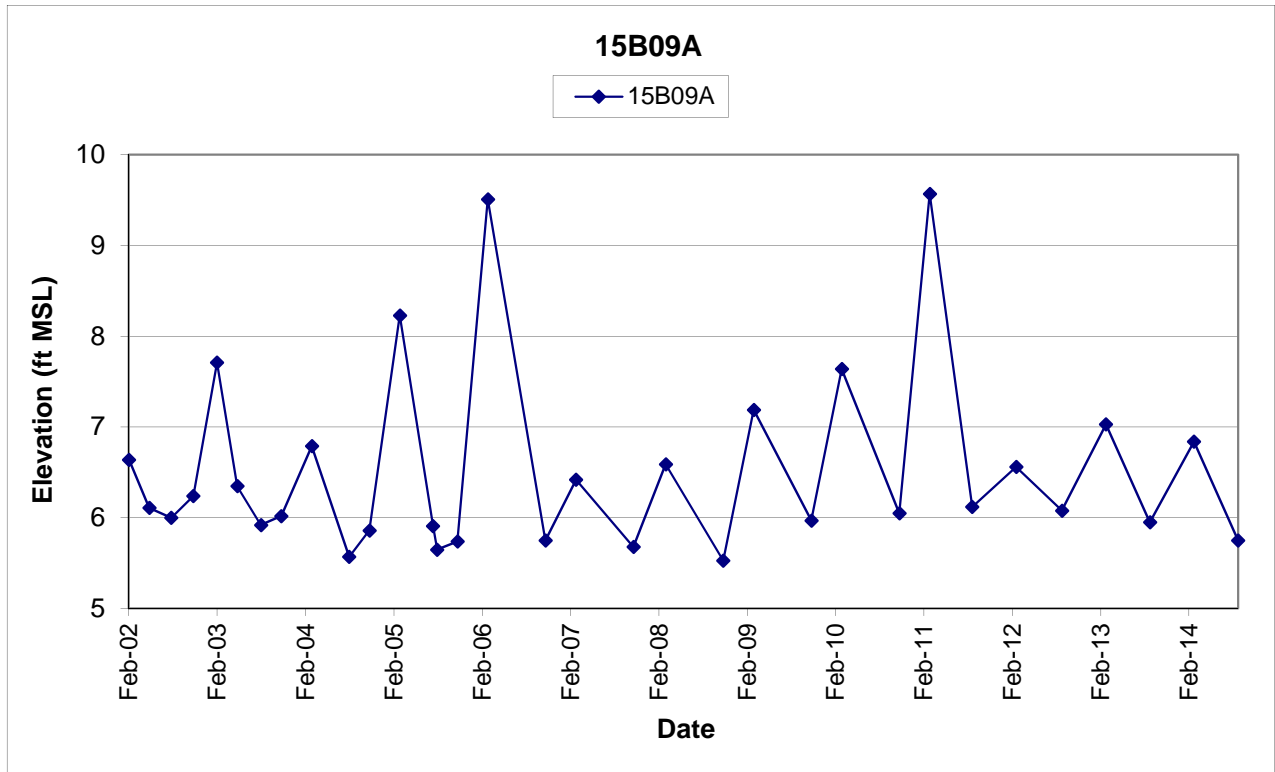
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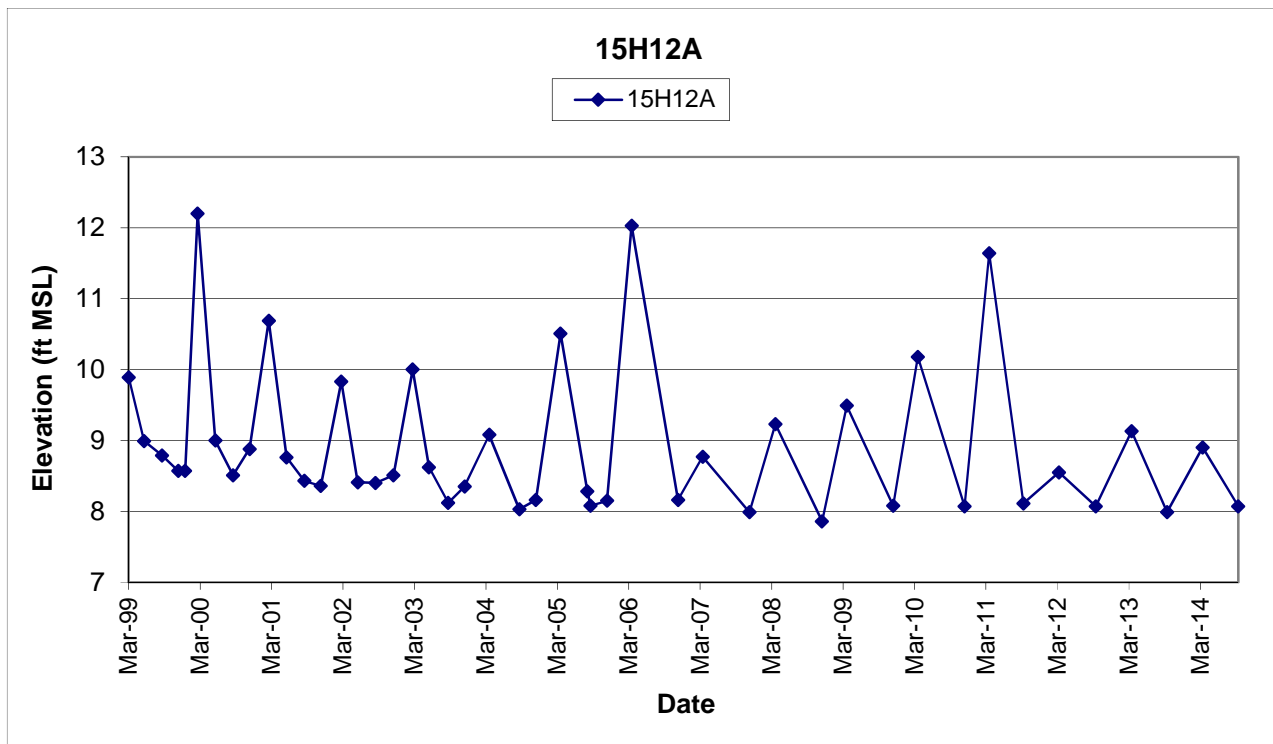
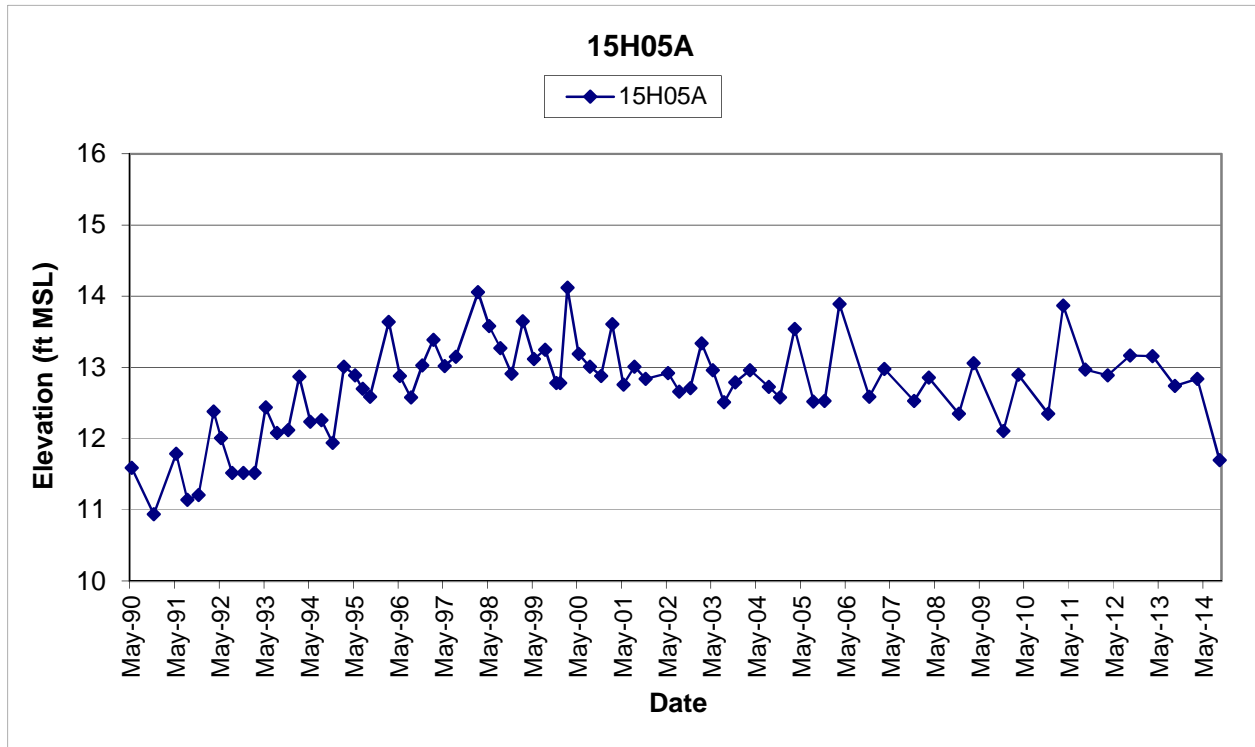
APPENDIX C
CY2014 Hydrographs



APPENDIX C
CY2014 Hydrographs



APPENDIX C
CY2014 Hydrographs





APPENDIX D

CY2014 Groundwater Analytical Results

APPENDIX D
2014 Groundwater Analytical Results
Volatile Organic Compounds

Well ID	Date	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl chloride (µg/L)	1,1,1-TCA (µg/L)	1,1-DCA (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)
10Q07A	10/6/2014	<0.50	16	20	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
11E02A	9/29/2014	<0.12	1.7	1.3	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
11M03A	9/29/2014	<0.12	22	1.1	<0.13	7.4	<0.17	<0.18	2.7	0.63	<0.29	1.6	2.4
11M16A1	9/29/2014	<0.12	13	1.1	<0.13	<0.092	<0.17	<0.18	0.89	<0.13	<0.29	<0.20	<0.15
11M17A	9/29/2014	<0.12	19	0.59	<0.13	4.5	<0.17	<0.18	1.5	<0.13	<0.29	1.3	0.95
11M21A	9/29/2014	<0.12	16	4.0	<0.13	14	<0.17	<0.18	3.8	0.40 ^J	<0.29	1.6	1.5
11M24A	9/30/2014	<0.12	1.0	<0.15	<0.13	2.5	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	1.2
11M25A	9/29/2014	0.72	0.89	<0.15	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
11N21A1	9/30/2014	<0.12	0.98	1.4	<0.13	<0.092	<0.17	<0.18	0.72	<0.13	<0.29	<0.20	<0.15
11N22A1	9/29/2014	<0.12	62	16	0.81	0.53	<0.17	<0.18	1.7	<0.13	<0.29	<0.20	1.7
11N26A	9/30/2014	<0.12	<0.11	<0.15	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
12L01A	10/7/2014	<0.50	27	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
14C60A	9/30/2014	<0.12	<0.11	1.4	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
14D02A	9/30/2014	<0.12	<0.11	0.86	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
14D09A	9/29/2014	<0.12	41	39	0.68	2.8	1.9	<0.18	2.2	<0.13	<0.29	<0.20	<0.15
14D13A	9/30/2014	<0.12	1.7	2.2	<0.13	<0.092	<0.17	<0.18	1.1	<0.13	<0.29	<0.20	<0.15
14D25A2	9/30/2014	<0.12	13	1.4	<0.13	0.74	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	0.71
14D28A	9/30/2014	2.5	16	57	1.3	8.1	1.5	16	4.2	<0.13	<0.29	<0.20	0.69
14D31A2	9/30/2014	<0.12	<0.11	<0.15	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
14D33A	9/30/2014	<0.12	<0.11	0.46 ^J	0.64	<0.092	5.3	<0.18	1.9	<0.13	<0.29	<0.20	<0.15
14D37A	9/29/2014	<0.12	<0.11	<0.15	<0.13	<0.092	<0.17	<0.18	<0.12	<0.13	<0.29	<0.20	<0.15
14E14A	9/29/2014	<0.12	17	17	<0.13	0.58	<0.17	<0.18	<0.13	<0.13	<0.29	<0.20	<0.15
15A06A	10/6/2014	<0.50	0.97	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1
15B02A	10/6/2014	<0.50	46	8.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cleanup Level		5.0	5.0	6.0	10	6.0	0.50	200	5.0	80*	NE	150	1,200

µg/L = micrograms per liter

J = detected, but below the Report Limit; therefore, result is an estimated concentration

NE = Not Established

APPENDIX D
2014 Groundwater Analytical Results
Volatile Organic Compounds

Well ID	Date	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	trans-1,2-DCE (µg/L)	1,1-DCE (µg/L)	Vinyl chloride (µg/L)	1,1,1-TCA (µg/L)	1,1-DCA (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)
15B03A	10/6/2014	<0.50	46	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
15B06A	10/7/2014	<0.50	94	15	1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
15H05A	9/29/2014	<0.12	0.31 ^J	<0.15	<0.13	<0.092	<0.17	<0.18	<0.13	<0.13	<0.29	<0.20	<0.15
MW-AS3	10/6/2014	<0.50	25	9.2	0.66	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-AS4	10/7/2014	<0.50	89	47	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-AS8	10/7/2014	<0.50	180	86	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-AS11	10/8/2014	<0.50	37	10	0.68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-AS13	10/6/2014	<0.50	58	20	0.79	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
NASA-1A	3/25/2014	<0.12	34	26	0.71	1.9	0.86	<0.18	2.3	<0.13	0.50	<0.20	1.2
NASA-1A	6/24/2014	<0.50	41	38	<0.50	2.8	<0.50	<0.50	3.3	<0.50	<0.50	<0.50	1.5
NASA-1A	9/29/2014	<0.12	40	28	0.73	2.4	0.58	<0.18	3.1	<0.13	<0.29	<0.50	1.5
NASA-1A	12/22/2014	<0.12	31	32	0.87	1.8	1.0	<0.18	2.4	<0.13	<0.29	<0.20	0.55
NASA-3A	3/25/2014	<0.12	10	1.2	<0.13	12	<0.17	1.1	3.9	0.42 ^J	0.45 ^J	1.6	1.8
NASA-3A	6/24/2014	<0.50	11	1.4	<0.50	19	<0.50	<0.50	5.7	0.56	<0.50	2.0	2.5
NASA-3A	9/29/2014	<0.12	11	0.84	<0.13	12	<0.17	<0.18	4.1	0.39 ^J	<0.29	2.1	1.7
NASA-3A	12/22/2014	<0.12	9.6	1.2	<0.13	11	<0.17	0.83	3.8	0.36 ^J	<0.29	1.5	1.1
PRB-25	10/7/2014	<0.50	4.8	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
PRB-29	10/8/2014	<0.50	52	19	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
PRB-30	10/6/2014	<0.50	90	35	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
PRB-31	10/6/2014	<0.50	74	29	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
WNB-08A1	9/30/2014	<0.12	14	4.1	<0.13	<0.092	<0.17	<0.18	0.82	<0.13	<0.29	<0.20	<0.15
WSI-04A1	9/29/2014	<0.12	58	0.72	<0.13	2.8	<0.17	<0.18	1.3	0.34 ^J	<0.29	1.5	1.7
W08-08A1	9/29/2014	<0.12	17	<0.15	<0.13	1.4	<0.17	<0.18	1.0	<0.13	<0.29	<0.20	1.0
Cleanup Level		5.0	5.0	6.0	10	6.0	0.50	200	5.0	80*	NE	150	1,200

µg/L = micrograms per liter

J = detected, but below the Report Limit; therefore, result is an estimated concentration

NE = Not Established

APPENDIX D
2014 Groundwater Analytical Results
Petroleum Hydrocarbons

Well ID	Date	TPH-MO (µg/L)	TPH-D (µg/L)	TPH-JP5/8 (µg/L)	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
11N26A	9/30/2014	<9.1	<2.1	590	200	<0.057	<0.10	<0.090	<0.35
14C60A	9/30/2014	<9.1	<2.1	41 ^J	440	<0.057	<0.10	<0.090	<0.35
14D02A	9/30/2014	<9.1	<2.1	<20	76	<0.057	<0.10	<0.090	<0.35
14D28A	9/30/2014	540	<2.1	<20	37 ^J	<0.057	<0.10	<0.090	<0.35
14D33A	9/30/2014	<9.1	<2.1	51	49 ^J	<0.057	<0.10	<0.090	<0.35
14D37A	9/29/2014	<9.1	<2.1	850	240	<0.057	<0.10	<0.090	<0.35
15A11A	3/26/2014	<9.1	<2.1	320	100	<0.061	<0.073	<0.045	<0.23
15A11A	6/25/2014	<50	<50	290	150	<0.50	<0.50	<0.50	<1.0
15A11A	9/29/2014	<9.1	<2.1	300	130	<0.061	<0.073	<0.045	<0.23
15A11A	12/22/2014	<9.1	320	<20	33 ^J	<0.11	<0.11	<0.10	<0.33
15H05A	9/29/2014	---	---	---	---	<0.057	0.24 ^J	<0.090	<0.35
NASA-1A	3/25/2014	<9.1	<2.1	<20	<10	<0.057	<0.10	<0.090	<0.35
NASA-1A	6/24/2014	<50	<50	<50	63	<0.30	<0.30	<0.30	<0.50
NASA-1A	9/29/2014	<9.1	<2.1	<20	44 ^J	<0.057	<0.10	<0.090	<0.35
NASA-1A	12/22/2014	12 ^J	<2.1	<20	25 ^J	<0.057	<0.10	<0.090	<0.35
TANK1-E	3/26/2014	<9.1	<2.1	<20	<10	<0.061	<0.073	<0.045	<0.23
TANK1-E	6/25/2014	<50	<50	<50	<50	<0.50	<0.50	<0.50	<1.0
TANK1-E	9/29/2014	<9.1	<2.1	<20	29 ^J	<0.061	<0.073	<0.045	<0.23
TANK1-E	12/22/2014	170	<2.1	<20	<10	<0.11	<0.11	<0.10	<0.33
Cleanup Level		640	700	700	50	1.0	150	300	1,750

µg/L = micrograms per liter

J = detected, but below the Report Limit; therefore, result is an estimated concentration

--- = Not Analyzed

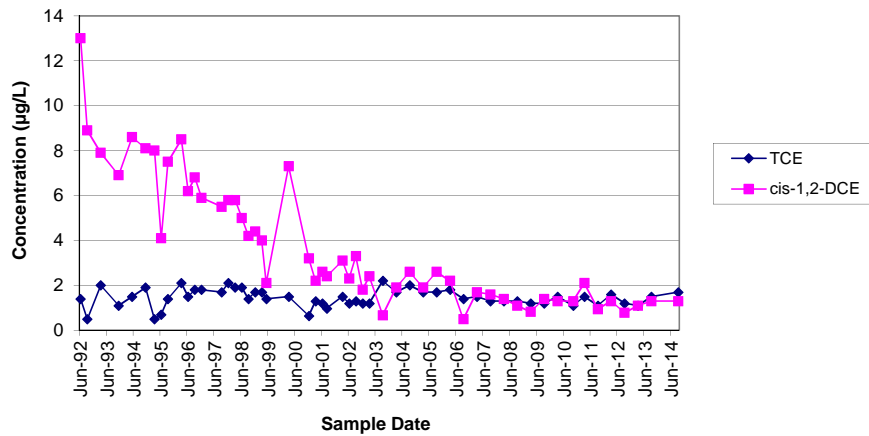


APPENDIX E

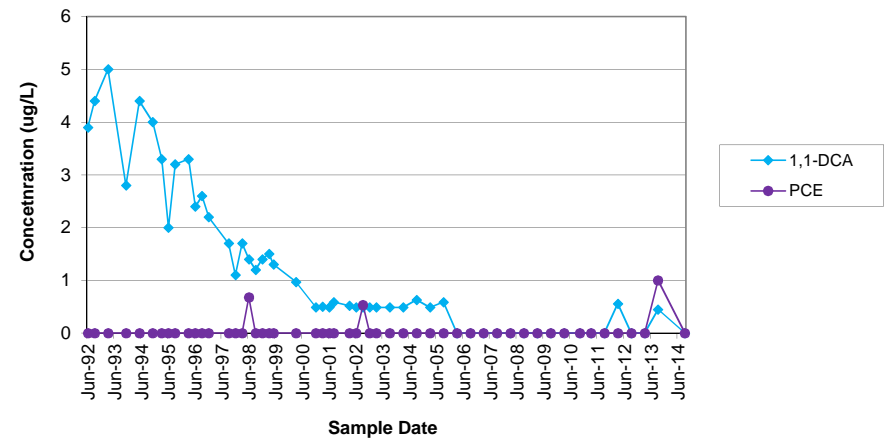
Concentration-Versus-Time Graphs

APPENDIX E
2014 Concentration-versus-Time Graphs

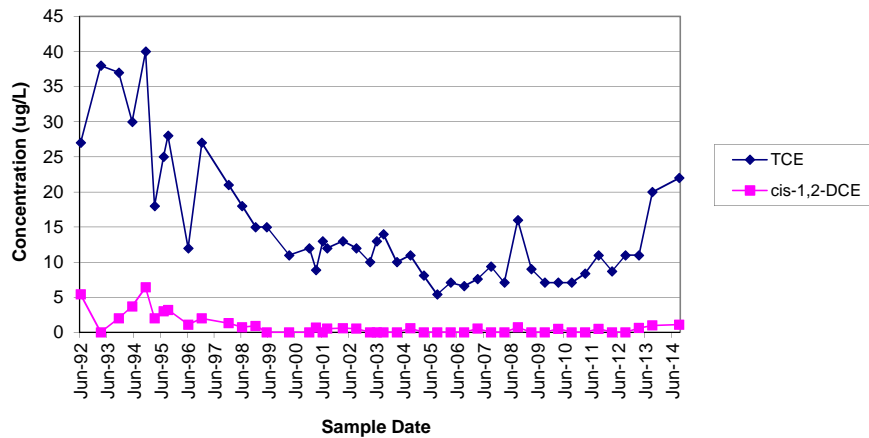
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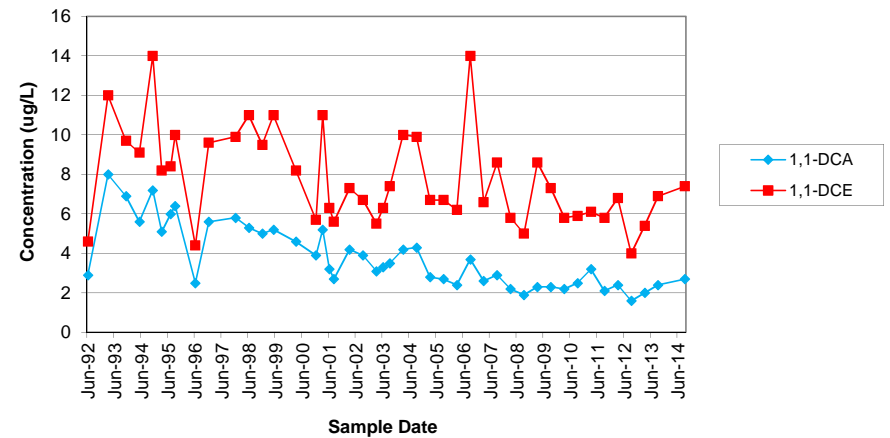
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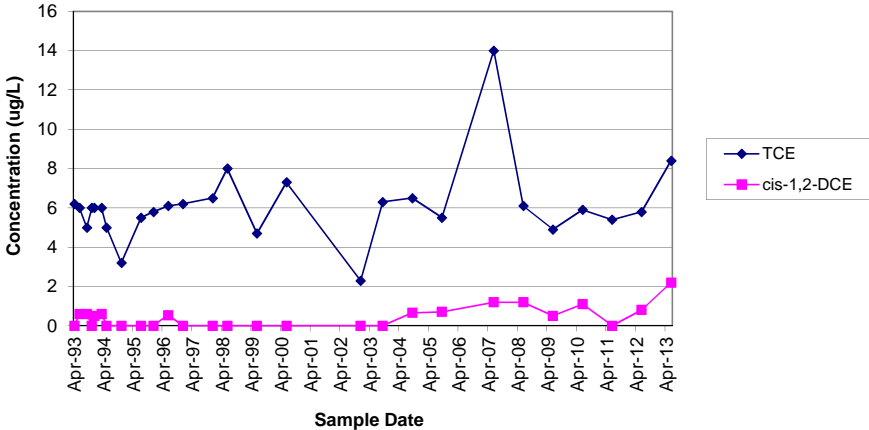


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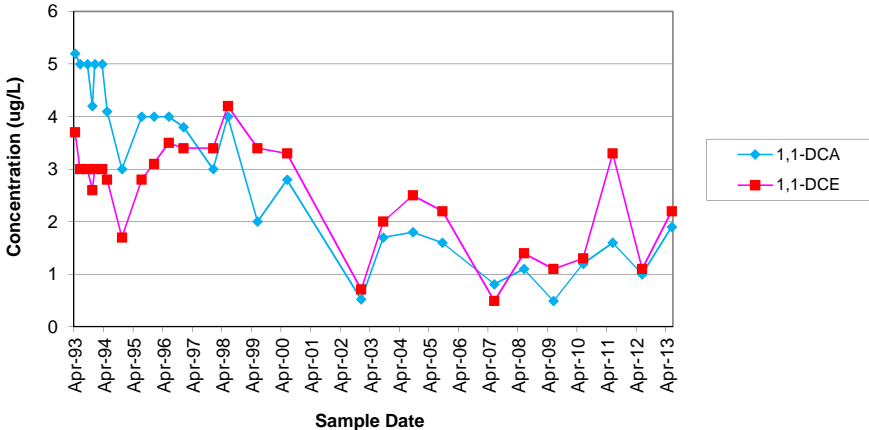


APPENDIX E
2014 Concentration-versus-Time Graphs

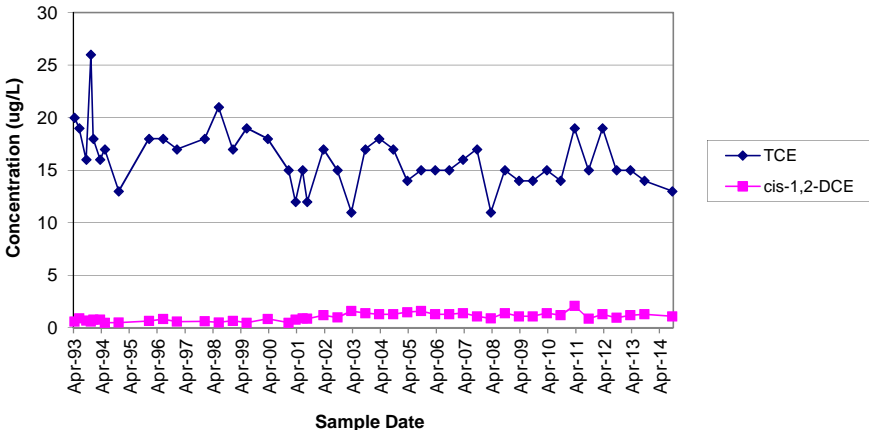
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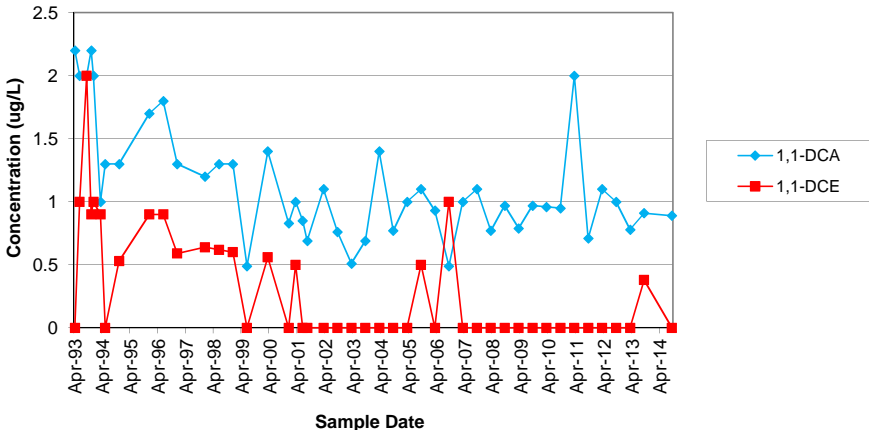
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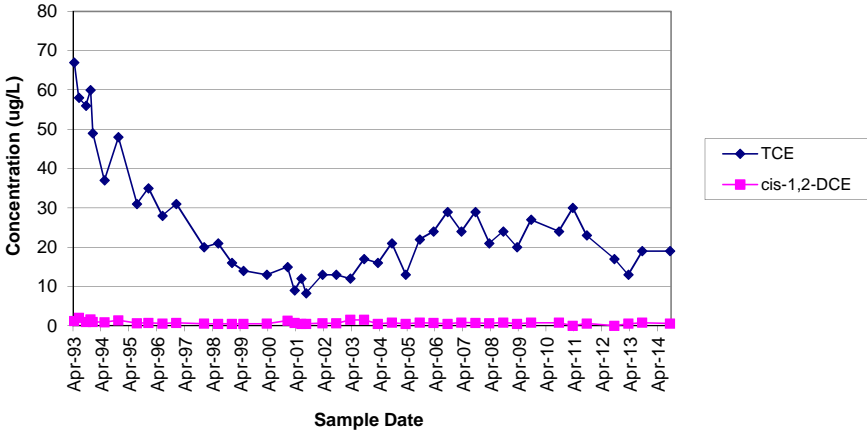


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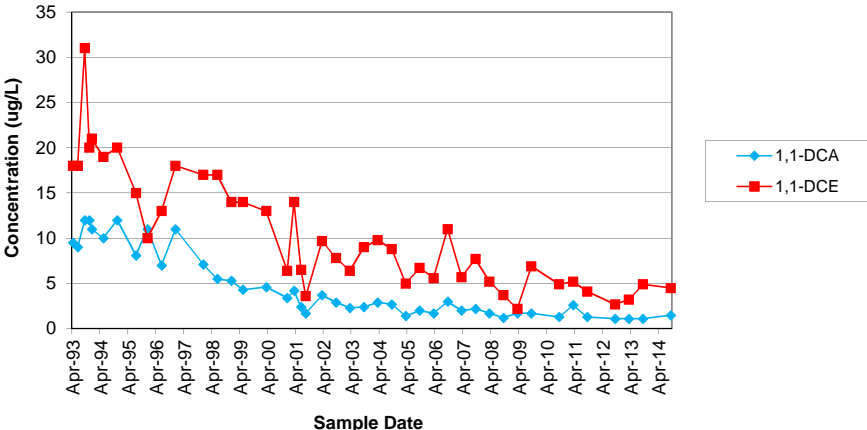


APPENDIX E
2014 Concentration-versus-Time Graphs

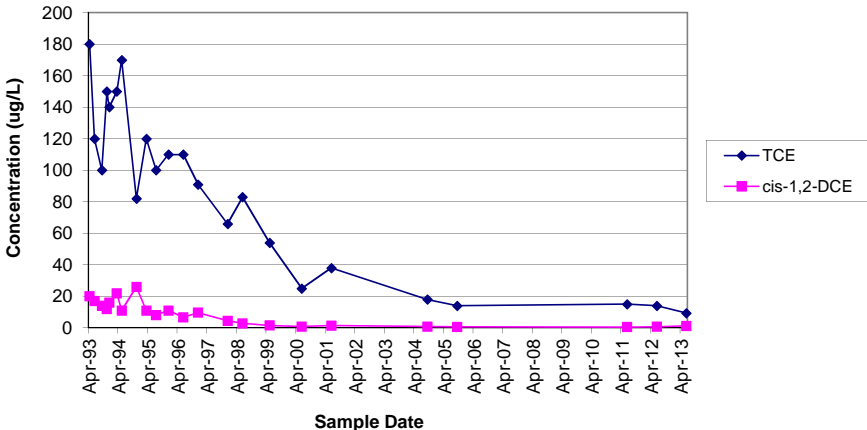
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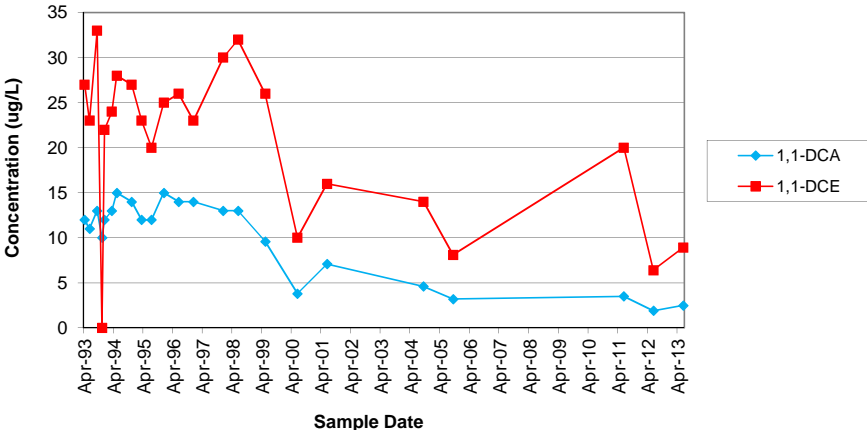
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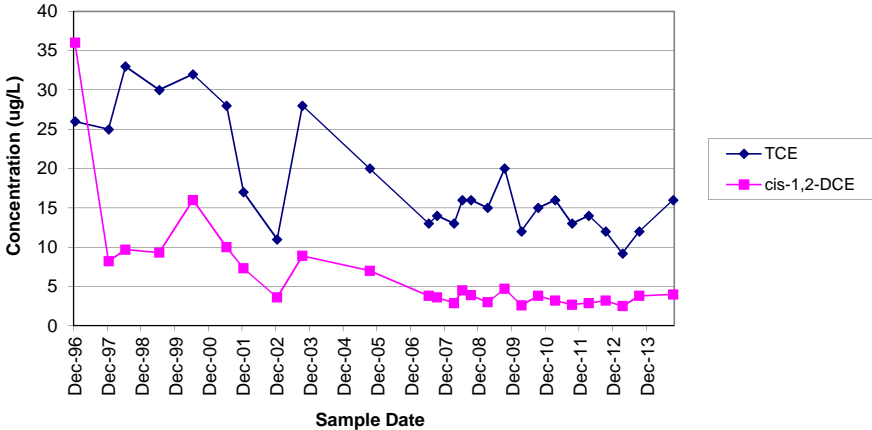


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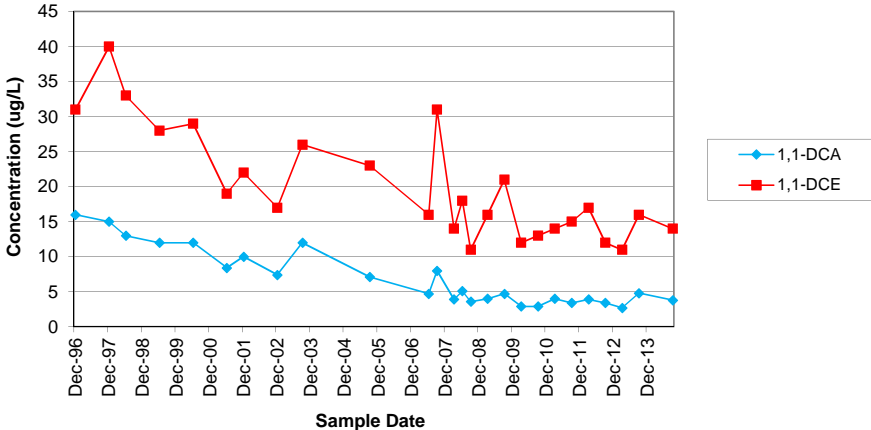


APPENDIX E
2014 Concentration-versus-Time Graphs

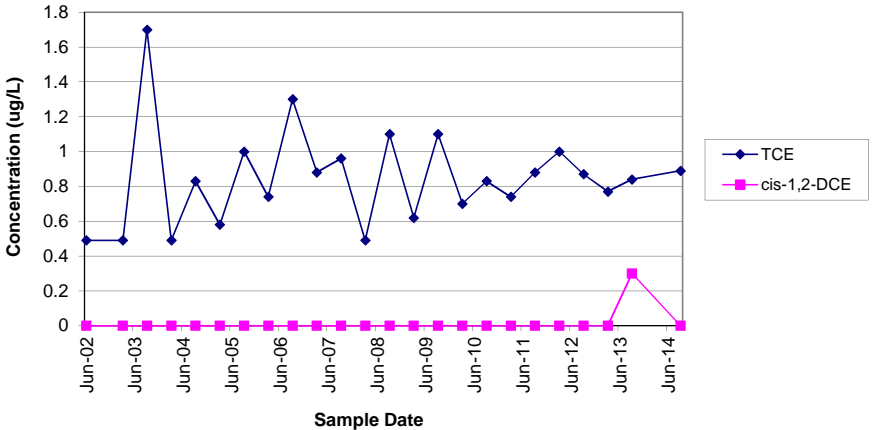
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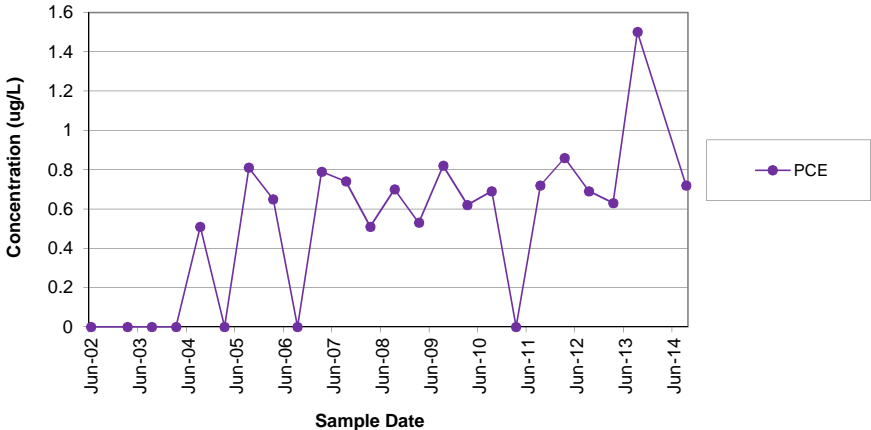
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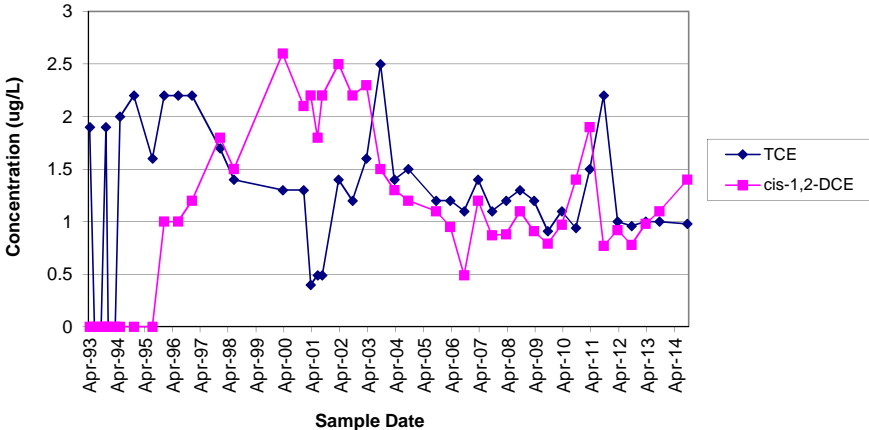


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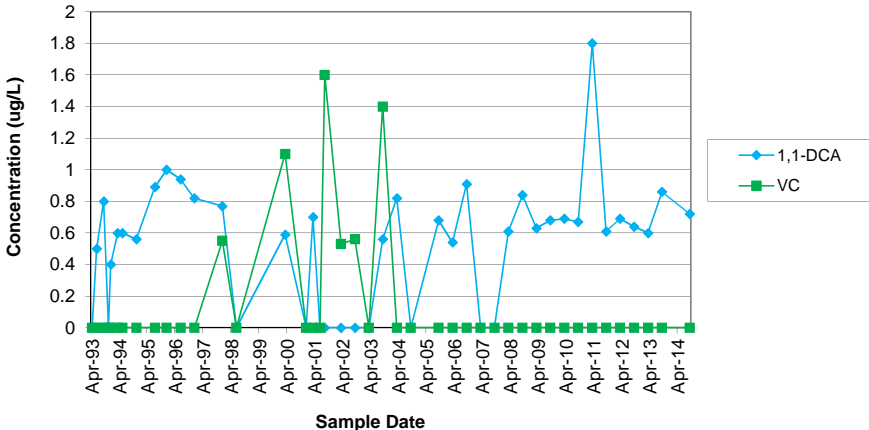


APPENDIX E
2014 Concentration-versus-Time Graphs

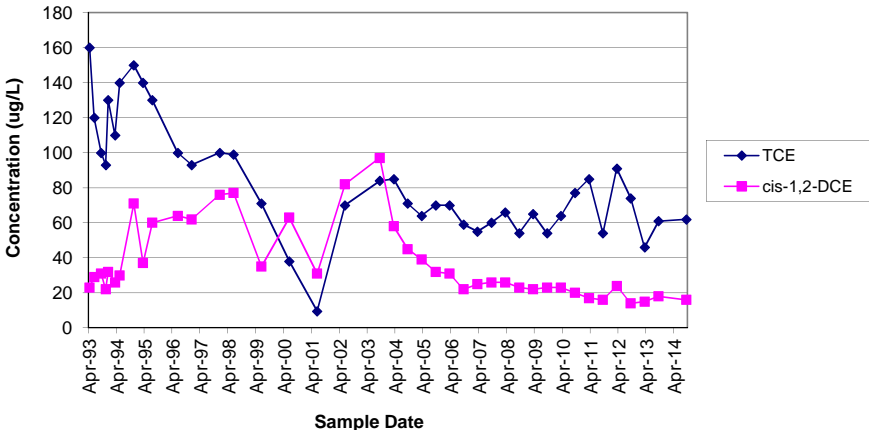
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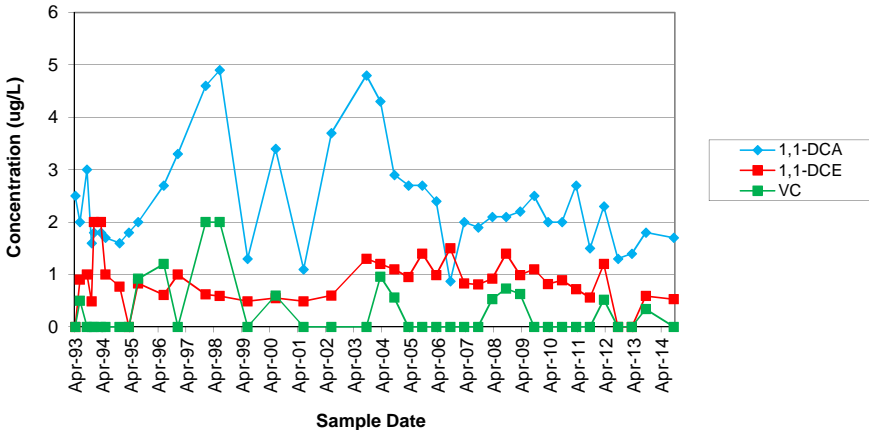
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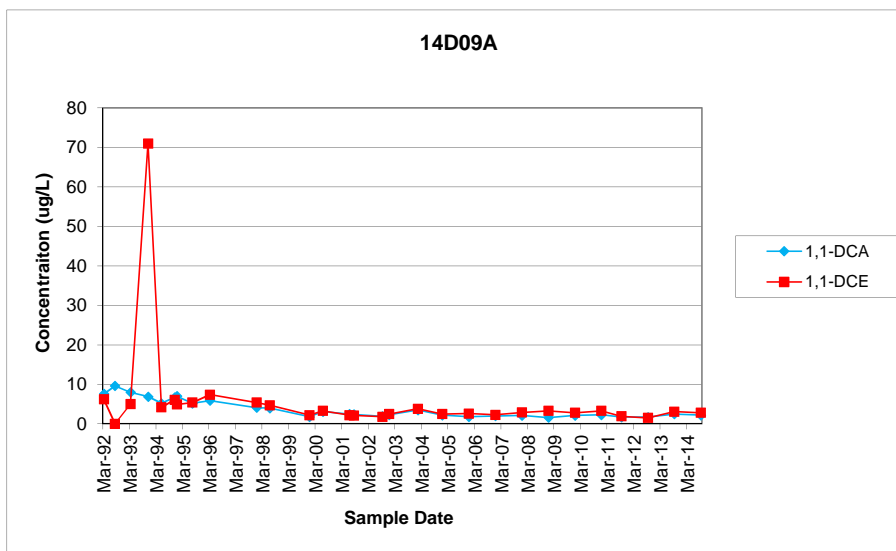
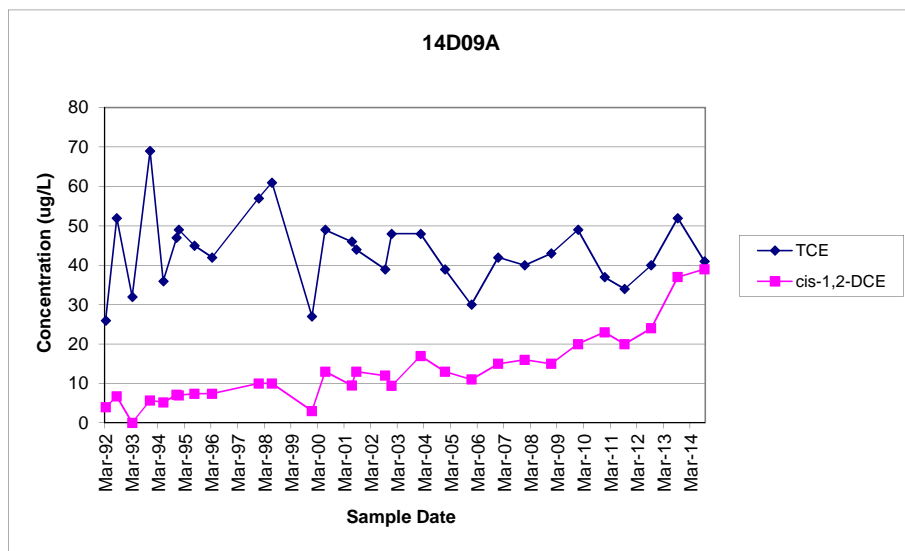
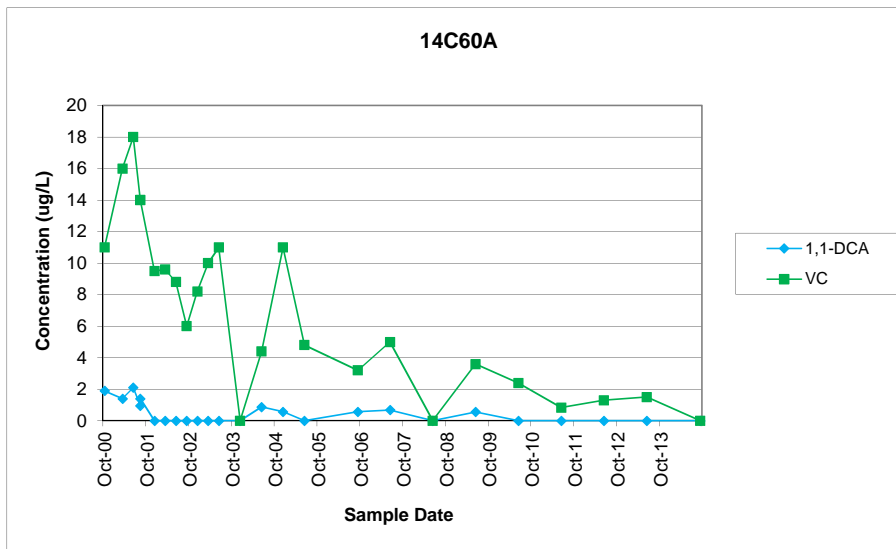
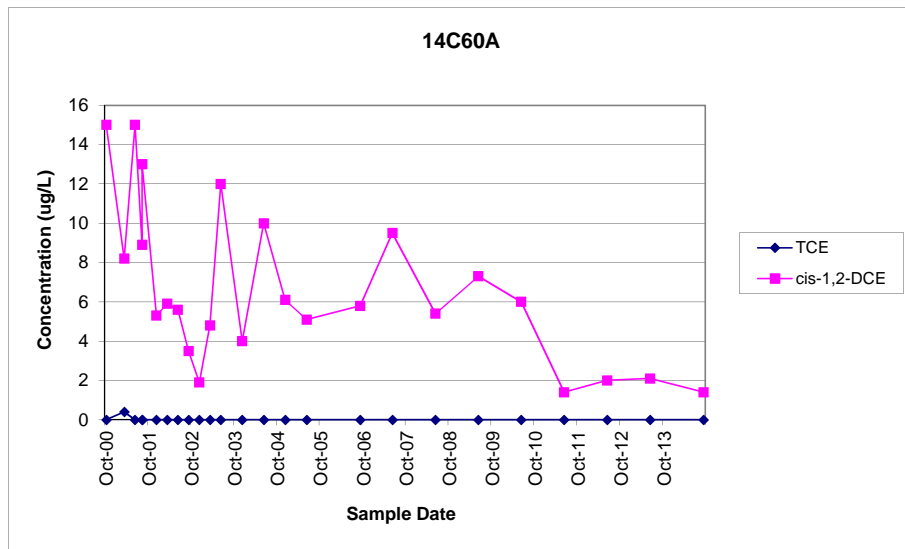
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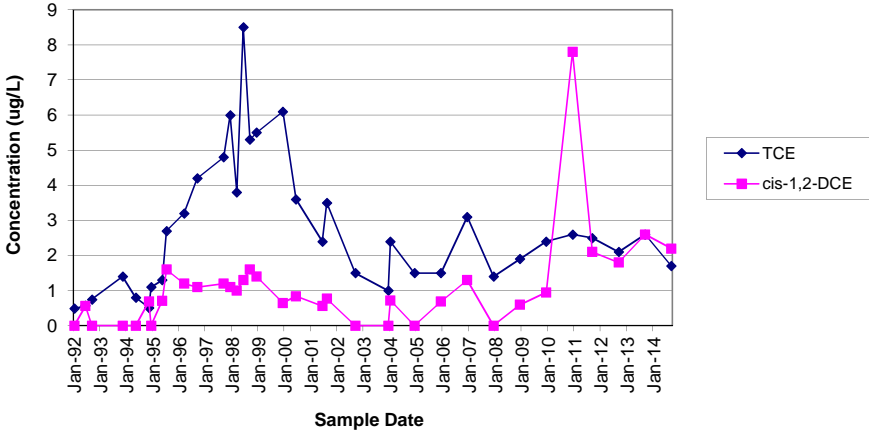


APPENDIX E
2014 Concentration-versus-Time Graphs

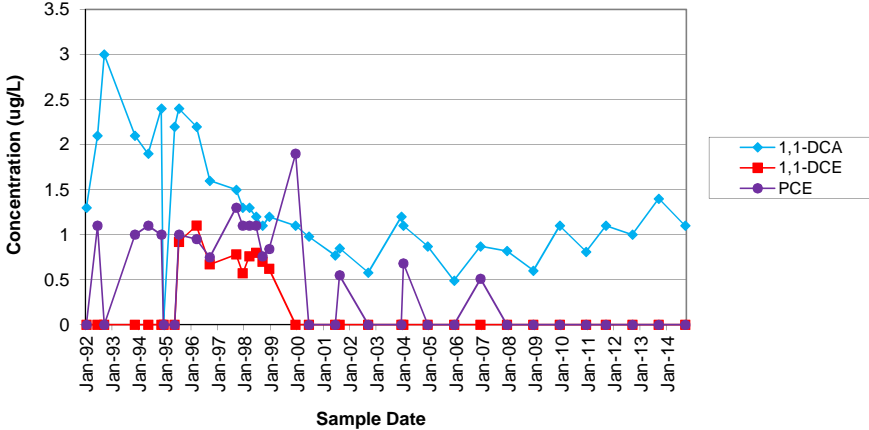


APPENDIX E
2014 Concentration-versus-Time Graphs

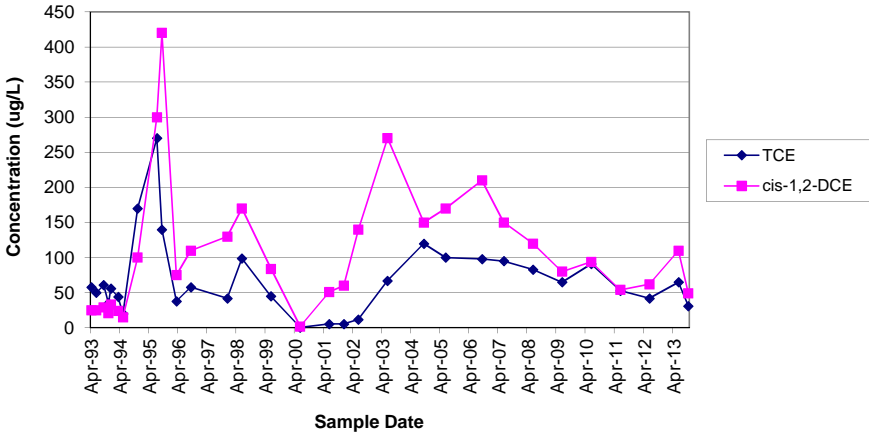
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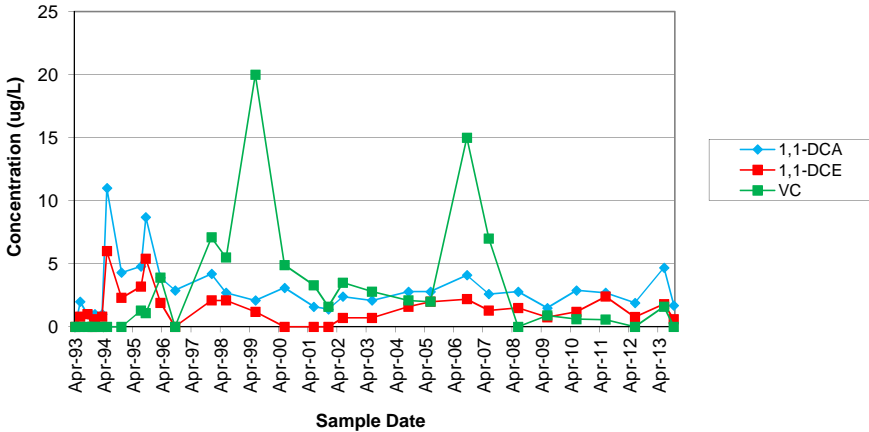
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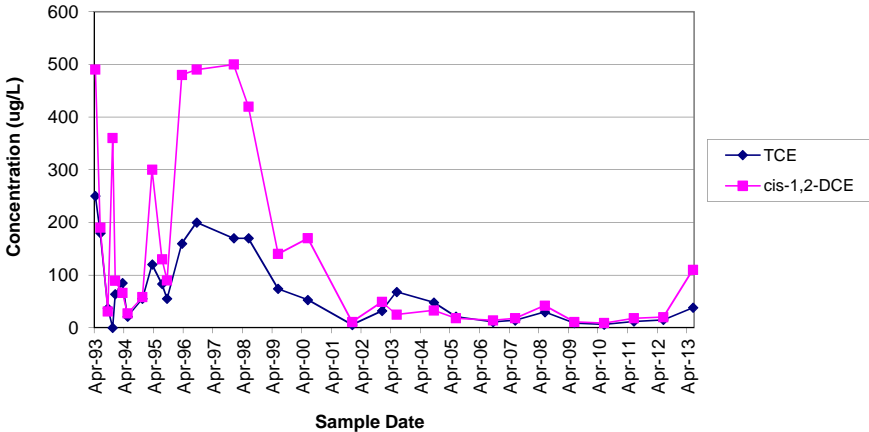


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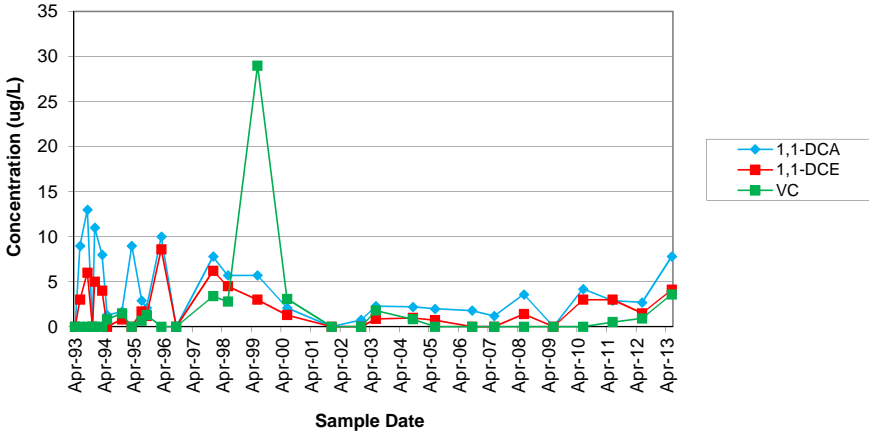


APPENDIX E
2014 Concentration-versus-Time Graphs

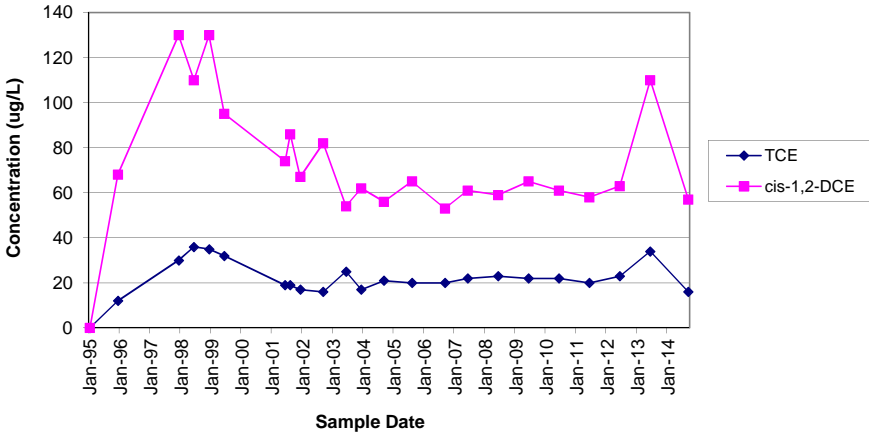
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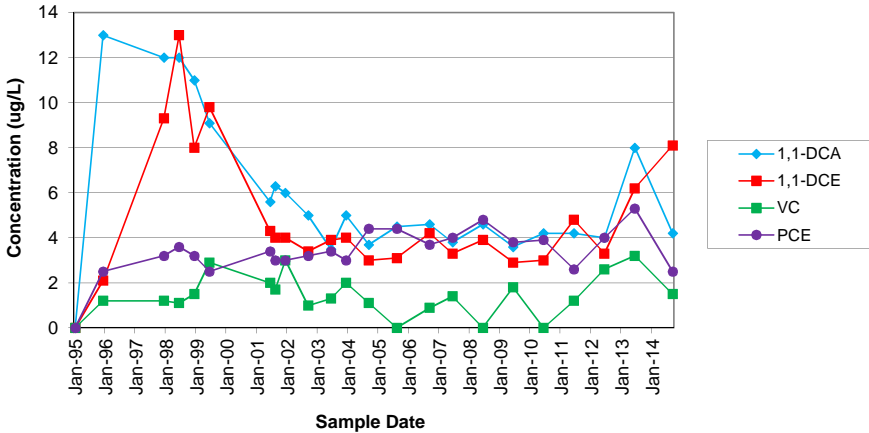
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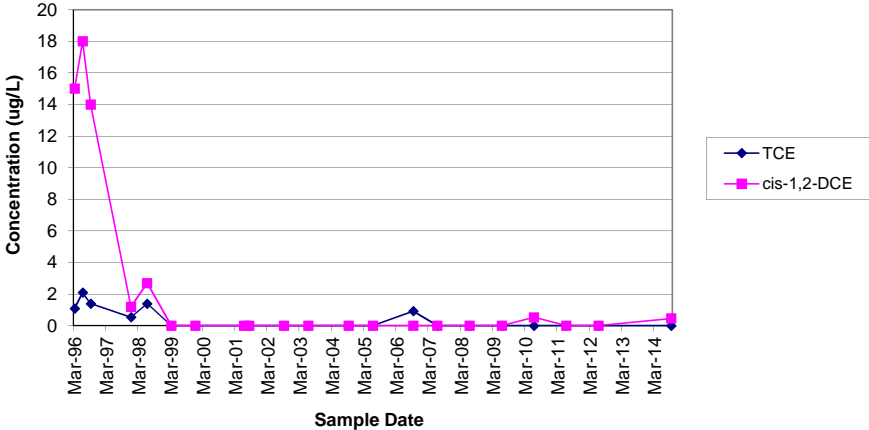


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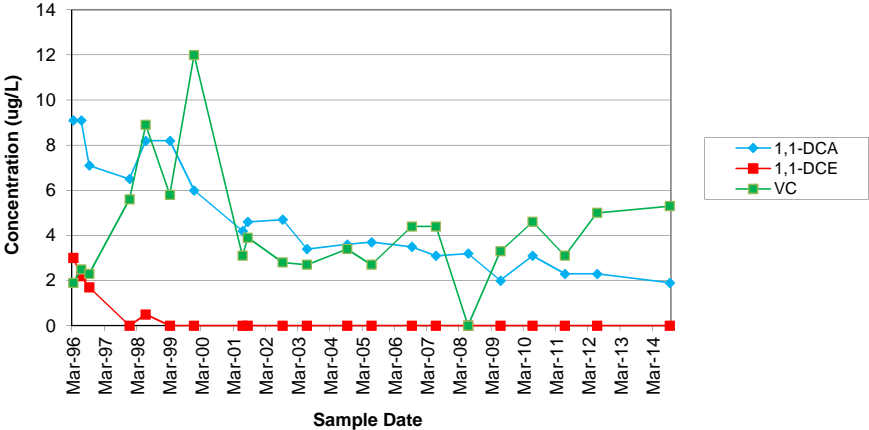


APPENDIX E
2014 Concentration-versus-Time Graphs

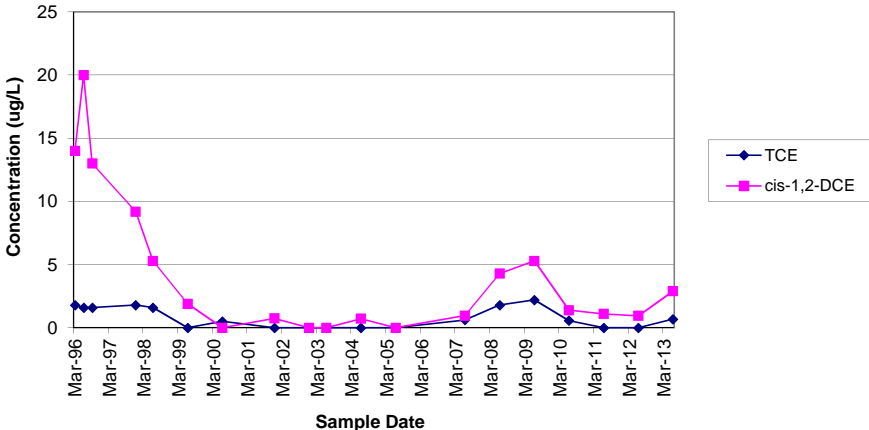
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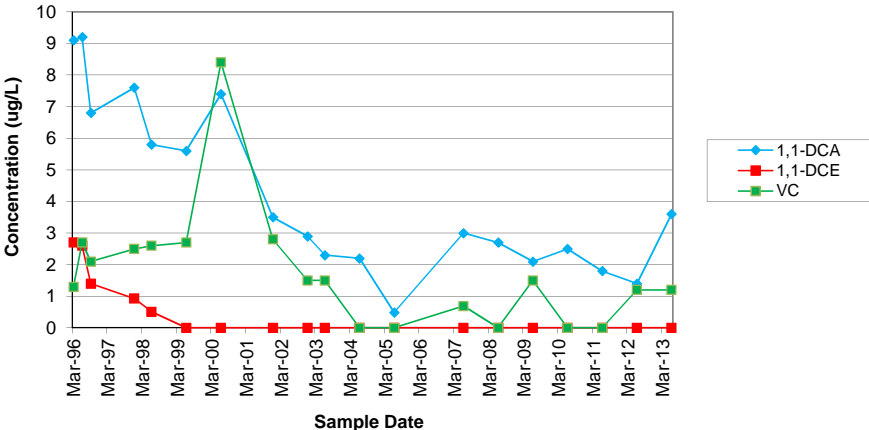
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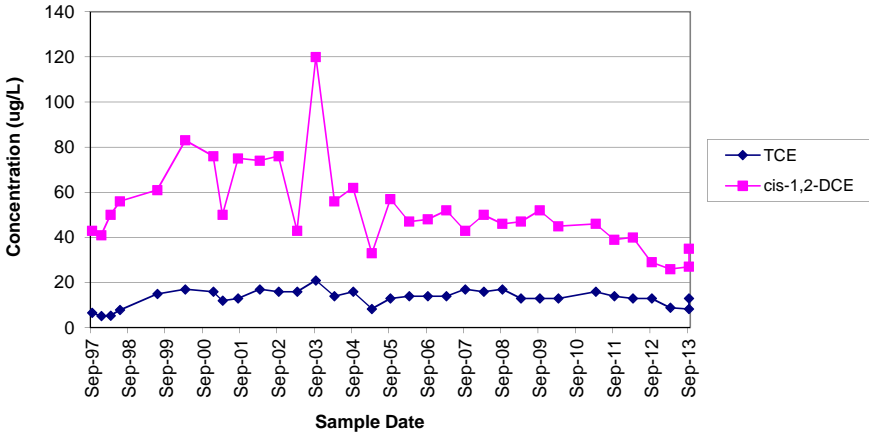


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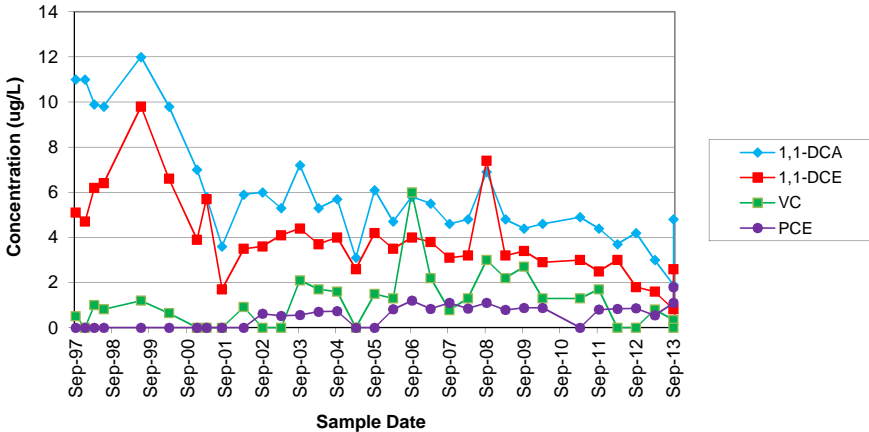


APPENDIX E
2014 Concentration-versus-Time Graphs

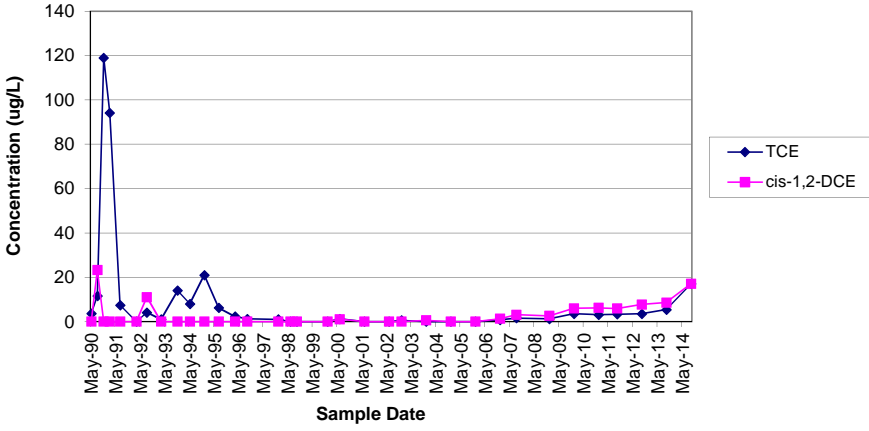
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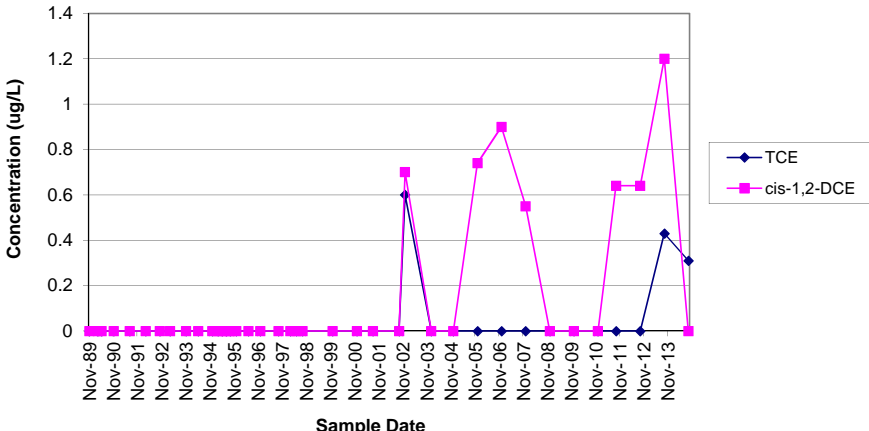
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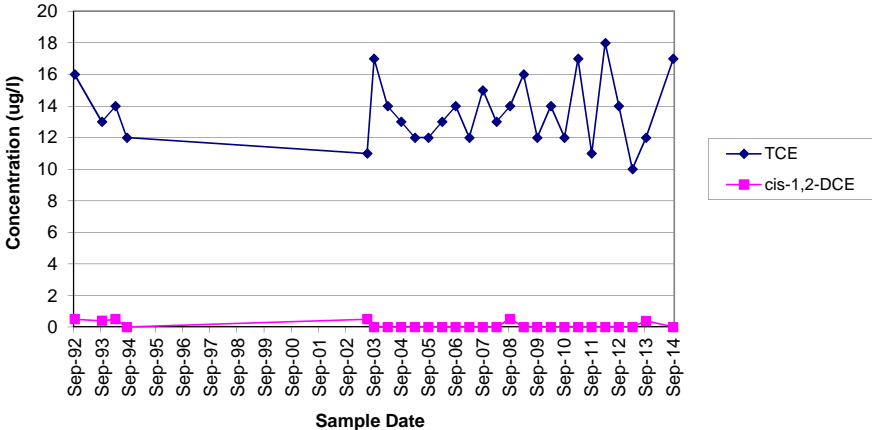


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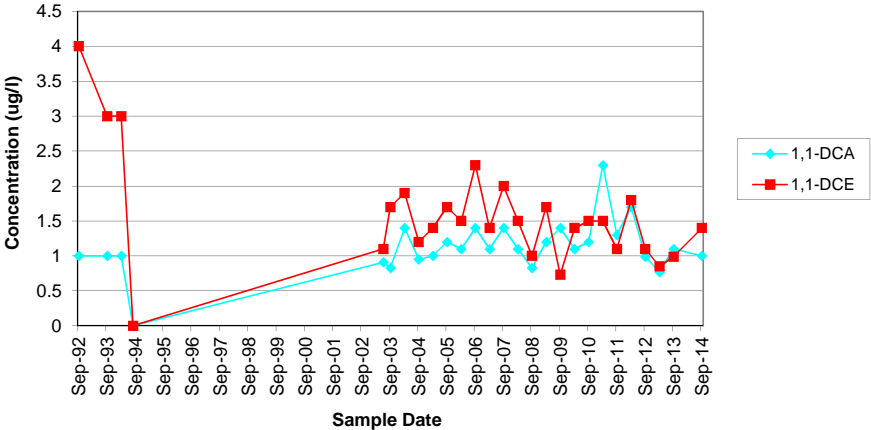


APPENDIX E
2014 Concentration-versus-Time Graphs

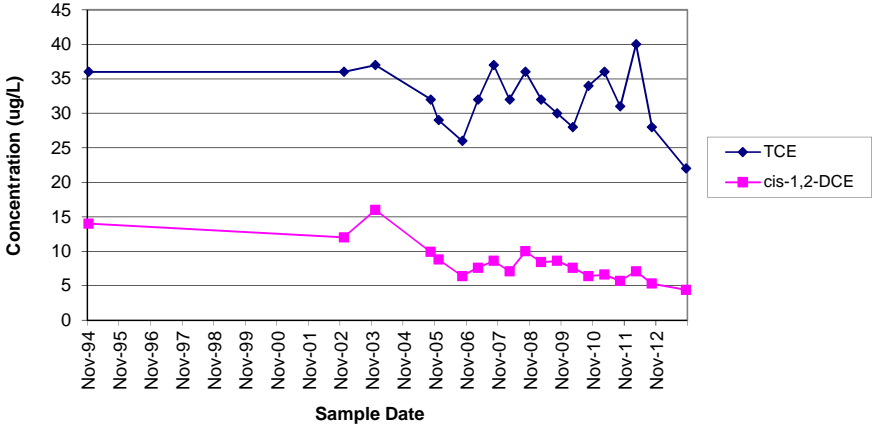
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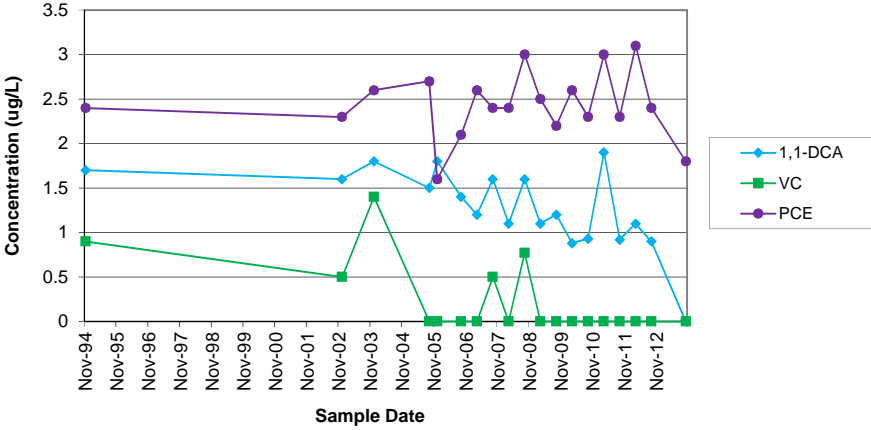
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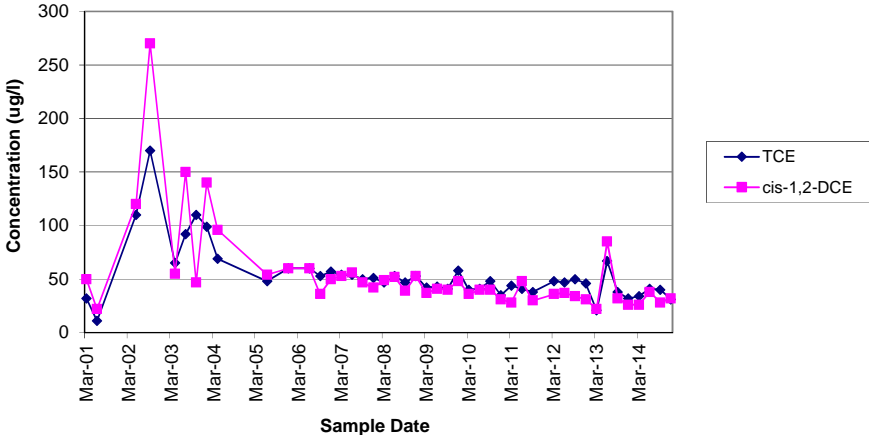


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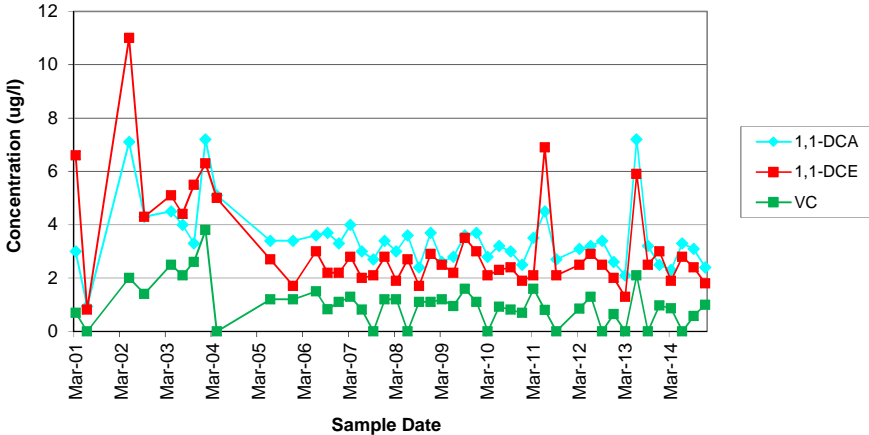


APPENDIX E
2014 Concentration-versus-Time Graphs

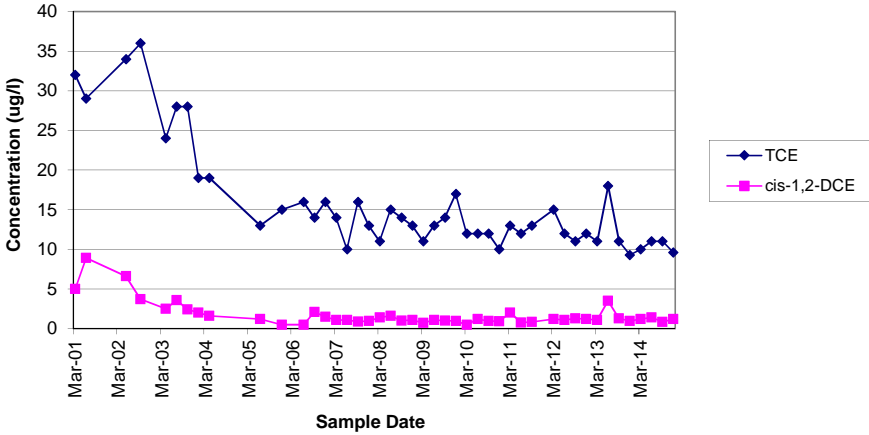
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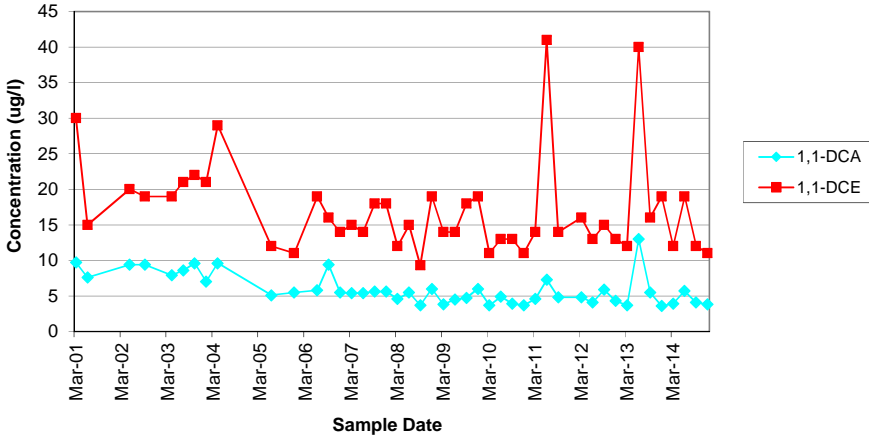
NASA-1A



NASA-3A



NASA-3A





APPENDIX F

CY2014 Laboratory Analytical Reports



Quarter 1, 2014

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

02 April 2014

CLS Work Order #: CXC1042

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

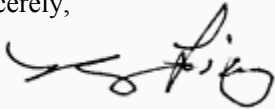
Moffet Field, CA 94053-1000

Project Name: Q1 2014 NASA RGRP Sampling

Enclosed are the results of analyses for samples received by the laboratory on 03/26/14 16:45. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,



James Liang, Ph.D.

Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXC1042-01) Water Sampled: 03/25/14 11:08 Received: 03/26/14 16:45											
<i>Surrogate: o-Terphenyl</i>	ahs	91 %		65-135	mg/L		CX02208	04/01/14	04/02/14	EPA 8015M	
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"	
JP-5/JP-8	ahs	ND	0.020	0.050	"	1	"	"	"	"	
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"	

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXC1042-01) Water Sampled: 03/25/14 11:08 Received: 03/26/14 16:45											
Surrogate: Toluene-d8	nt	94 %		72-125	µg/L		CX02148	03/27/14	03/28/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	111 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	102 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	0.86	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	34	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	0.71	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	26	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	0.50	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	1.9	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	2.3	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXC1042-01) Water Sampled: 03/25/14 11:08 Received: 03/26/14 16:45											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.2	0.15	0.50	µg/L	1	CX02148	03/27/14	03/28/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
NASA-3A (CXC1042-02) Water Sampled: 03/25/14 11:16 Received: 03/26/14 16:45											
<i>Surrogate: Toluene-d8</i>	nt	<i>95 %</i>	<i>72-125</i>		µg/L		<i>CX02148</i>	<i>03/27/14</i>	<i>03/28/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>114 %</i>	<i>73-125</i>		"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>105 %</i>	<i>65-135</i>		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	1.6	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	10	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.2	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	0.45	0.29	0.50	"	1	"	"	"	"	J
Chloroform	nt	0.42	0.13	0.50	"	1	"	"	"	"	J
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-3A (CXC1042-02) Water Sampled: 03/25/14 11:16 Received: 03/26/14 16:45											
1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX02148	03/27/14	03/28/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	12	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	3.9	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.8	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	1.1	0.18	0.50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

TPH-Gasoline by GC/MS

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXC1042-01) Water Sampled: 03/25/14 11:08 Received: 03/26/14 16:45											
<i>Surrogate: Toluene-d8</i>	nt	93 %		65-135	µg/L		CX02148	03/27/14	03/27/14	EPA 8260M	
Gasoline	nt	ND	10	50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX02208 - EPA 3510B GCNV

Blank (CX02208-BLK1)

Prepared: 04/01/14 Analyzed: 04/02/14

JP-5/JP-8	ND	0.020	0.050	mg/L							
Kerosene	ND	0.0036	0.050	"							
Mineral Oil	ND	0.020	0.050	"							
Hydraulic Oil	ND	0.030	0.050	"							
Motor Oil	ND	0.0091	0.050	"							
Diesel	ND	0.0021	0.050	"							

Surrogate: o-Terphenyl 0.0411 " 0.0500 82 65-135

LCS (CX02208-BS1)

Prepared: 04/01/14 Analyzed: 04/02/14

Diesel	3.07	0.0021	0.050	mg/L	2.50		123	65-135			
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Surrogate: o-Terphenyl 0.0528 " 0.0500 106 65-135

LCS Dup (CX02208-BS1)

Prepared: 04/01/14 Analyzed: 04/02/14

Diesel	3.00	0.0021	0.050	mg/L	2.50		120	65-135	2	30	
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Surrogate: o-Terphenyl 0.0509 " 0.0500 102 65-135

Matrix Spike (CX02208-MS1)

Source: CXC1151-01

Prepared: 04/01/14 Analyzed: 04/02/14

Diesel	2.95	0.0021	0.050	mg/L	2.50	ND	118	46-137			
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Surrogate: o-Terphenyl 0.0544 " 0.0500 109 65-135

Matrix Spike Dup (CX02208-MSD1)

Source: CXC1151-01

Prepared: 04/01/14 Analyzed: 04/02/14

Diesel	2.92	0.0021	0.050	mg/L	2.50	ND	117	46-137	1	30	
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Surrogate: o-Terphenyl 0.0435 " 0.0500 87 65-135

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Earth Resource Technologies c/o NASA-Ames
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Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX02148 - EPA 5030 Water MS

Blank (CX02148-BLK1)

Prepared & Analyzed: 03/27/14

Xylenes (total)	ND	0.35	0.50	µg/L
Vinyl chloride	ND	0.17	0.50	"
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.15	0.50	"
Trichlorofluoromethane	ND	0.20	0.50	"
Trichloroethene	ND	0.11	0.50	"
1,1,2-Trichloroethane	ND	0.098	0.50	"
1,1,1-Trichloroethane	ND	0.18	0.50	"
Toluene	ND	0.10	0.30	"
Tetrachloroethene	ND	0.12	0.50	"
1,1,2,2-Tetrachloroethane	ND	0.13	0.50	"
Methylene chloride	ND	0.24	0.50	"
Ethylbenzene	ND	0.090	0.30	"
trans-1,3-Dichloropropene	ND	0.12	0.50	"
cis-1,3-Dichloropropene	ND	0.097	0.50	"
1,2-Dichloropropane	ND	0.057	0.50	"
trans-1,2-Dichloroethene	ND	0.13	0.50	"
cis-1,2-Dichloroethene	ND	0.15	0.50	"
1,1-Dichloroethene	ND	0.092	0.50	"
1,2-Dichloroethane	ND	0.054	0.50	"
1,1-Dichloroethane	ND	0.12	0.50	"
Dichlorodifluoromethane (Freon 12)	ND	0.37	0.50	"
1,4-Dichlorobenzene	ND	0.061	0.30	"
1,3-Dichlorobenzene	ND	0.081	0.30	"
1,2-Dichlorobenzene	ND	0.042	0.30	"
Dibromochloromethane	ND	0.13	0.50	"
Chloromethane	ND	0.29	0.50	"
Chloroform	ND	0.13	0.50	"
2-Chloroethylvinyl ether	ND	0.11	2.0	"
Chloroethane	ND	0.20	0.50	"
Chlorobenzene	ND	0.11	0.30	"
Carbon tetrachloride	ND	0.092	0.50	"
Bromomethane	ND	0.20	0.50	"
Bromoform	ND	0.16	0.50	"
Bromodichloromethane	ND	0.061	0.50	"
Benzene	ND	0.057	0.30	"

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX02148 - EPA 5030 Water MS

Blank (CX02148-BLK1)

Prepared & Analyzed: 03/27/14

Surrogate: 4-Bromofluorobenzene	11.6			µg/L	10.0		116	73-125			
Surrogate: Toluene-d8	9.35			"	10.0		94	72-125			
Surrogate: 1,2-Dichloroethane-d4	9.55			"	10.0		96	65-135			

LCS (CX02148-BS1)

Prepared & Analyzed: 03/27/14

Vinyl chloride	22.0	0.17	0.50	µg/L	20.0		110	10-251			
Trichlorofluoromethane	19.5	0.20	0.50	"	20.0		97	47-181			
Trichloroethene	20.5	0.11	0.50	"	20.0		103	71-157			
1,1,2-Trichloroethane	19.5	0.098	0.50	"	20.0		98	52-150			
1,1,1-Trichloroethane	16.6	0.18	0.50	"	20.0		83	52-162			
Toluene	20.3	0.10	0.30	"	20.0		102	47-150			
Tetrachloroethene	21.5	0.12	0.50	"	20.0		108	64-148			
1,1,2,2-Tetrachloroethane	16.9	0.13	0.50	"	20.0		84	46-148			
Methylene chloride	22.3	0.24	0.50	"	20.0		111	5-221			
Ethylbenzene	20.0	0.090	0.30	"	20.0		100	37-162			
trans-1,3-Dichloropropene	11.6	0.12	0.50	"	20.0		58	17-183			
cis-1,3-Dichloropropene	15.0	0.097	0.50	"	20.0		75	5-227			
1,2-Dichloropropane	20.0	0.057	0.50	"	20.0		100	5-210			
trans-1,2-Dichloroethene	19.9	0.13	0.50	"	20.0		100	54-156			
1,1-Dichloroethene	22.5	0.092	0.50	"	20.0		112	5-234			
1,2-Dichloroethane	19.0	0.054	0.50	"	20.0		95	49-155			
1,1-Dichloroethane	19.3	0.12	0.50	"	20.0		97	59-155			
Dichlorodifluoromethane (Freon 12)	20.4	0.37	0.50	"	20.0		102	50-150			
1,4-Dichlorobenzene	18.9	0.061	0.30	"	20.0		94	18-190			
1,3-Dichlorobenzene	19.0	0.081	0.30	"	20.0		95	59-156			
1,2-Dichlorobenzene	19.4	0.042	0.30	"	20.0		97	18-190			
Dibromochloromethane	12.9	0.13	0.50	"	20.0		64	53-149			
Chloromethane	22.0	0.29	0.50	"	20.0		110	10-273			
Chloroform	19.2	0.13	0.50	"	20.0		96	51-138			
Chloroethane	22.1	0.20	0.50	"	20.0		111	14-230			
Chlorobenzene	18.7	0.11	0.30	"	20.0		94	37-160			
Carbon tetrachloride	16.1	0.092	0.50	"	20.0		81	70-140			
Bromomethane	18.4	0.20	0.50	"	20.0		92	10-242			
Bromoform	14.2	0.16	0.50	"	20.0		71	45-169			

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX02148 - EPA 5030 Water MS

LCS (CX02148-BS1)

Prepared & Analyzed: 03/27/14

Bromodichloromethane	14.7	0.061	0.50	µg/L	20.0		74	35-155			
Benzene	20.3	0.057	0.30	"	20.0		101	37-151			

<i>Surrogate: 4-Bromofluorobenzene</i>	<i>10.3</i>			<i>"</i>	<i>10.0</i>		<i>103</i>	<i>73-125</i>			
<i>Surrogate: Toluene-d8</i>	<i>10.2</i>			<i>"</i>	<i>10.0</i>		<i>102</i>	<i>72-125</i>			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>9.17</i>			<i>"</i>	<i>10.0</i>		<i>92</i>	<i>65-135</i>			

LCS Dup (CX02148-BSD1)

Prepared & Analyzed: 03/27/14

Vinyl chloride	22.5	0.17	0.50	µg/L	20.0		112	10-251	2	30	
Trichlorofluoromethane	21.8	0.20	0.50	"	20.0		109	47-181	11	30	
Trichloroethene	22.6	0.11	0.50	"	20.0		113	71-157	9	30	
1,1,2-Trichloroethane	22.0	0.098	0.50	"	20.0		110	52-150	12	30	
1,1,1-Trichloroethane	19.0	0.18	0.50	"	20.0		95	52-162	13	30	
Toluene	22.4	0.10	0.30	"	20.0		112	47-150	10	30	
Tetrachloroethene	23.5	0.12	0.50	"	20.0		118	64-148	9	30	
1,1,2,2-Tetrachloroethane	18.9	0.13	0.50	"	20.0		94	46-148	11	30	
Methylene chloride	25.3	0.24	0.50	"	20.0		126	5-221	13	30	
Ethylbenzene	22.3	0.090	0.30	"	20.0		111	37-162	11	30	
trans-1,3-Dichloropropene	14.8	0.12	0.50	"	20.0		74	17-183	24	30	
cis-1,3-Dichloropropene	17.9	0.097	0.50	"	20.0		90	5-227	18	30	
1,2-Dichloropropane	21.8	0.057	0.50	"	20.0		109	5-210	9	30	
trans-1,2-Dichloroethene	22.6	0.13	0.50	"	20.0		113	54-156	12	30	
1,1-Dichloroethene	23.3	0.092	0.50	"	20.0		116	5-234	3	30	
1,2-Dichloroethane	21.4	0.054	0.50	"	20.0		107	49-155	12	30	
1,1-Dichloroethane	21.9	0.12	0.50	"	20.0		109	59-155	12	30	
Dichlorodifluoromethane (Freon 12)	22.4	0.37	0.50	"	20.0		112	50-150	9	30	
1,4-Dichlorobenzene	21.0	0.061	0.30	"	20.0		105	18-190	11	30	
1,3-Dichlorobenzene	21.0	0.081	0.30	"	20.0		105	59-156	10	30	
1,2-Dichlorobenzene	21.5	0.042	0.30	"	20.0		108	18-190	11	30	
Dibromochloromethane	15.7	0.13	0.50	"	20.0		79	53-149	20	30	
Chloromethane	18.3	0.29	0.50	"	20.0		91	10-273	18	30	
Chloroform	21.5	0.13	0.50	"	20.0		108	51-138	11	30	
Chloroethane	24.9	0.20	0.50	"	20.0		124	14-230	12	30	
Chlorobenzene	20.7	0.11	0.30	"	20.0		104	37-160	10	30	
Carbon tetrachloride	19.1	0.092	0.50	"	20.0		96	70-140	17	30	

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CALIFORNIA LABORATORY SERVICES

04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch CX02148 - EPA 5030 Water MS

LCS Dup (CX02148-BSD1)

Prepared & Analyzed: 03/27/14

Bromomethane	22.0	0.20	0.50	µg/L	20.0		110	10-242	18	30	
Bromoform	17.2	0.16	0.50	"	20.0		86	45-169	19	30	
Bromodichloromethane	16.9	0.061	0.50	"	20.0		85	35-155	14	30	
Benzene	22.0	0.057	0.30	"	20.0		110	37-151	8	30	
<hr/>											
Surrogate: 4-Bromofluorobenzene	10.2			"	10.0		102	73-125			
Surrogate: Toluene-d8	10.3			"	10.0		103	72-125			
Surrogate: 1,2-Dichloroethane-d4	9.27			"	10.0		93	65-135			

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

TPH-Gasoline by GC/MS - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch CX02148 - EPA 5030 Water MS

Blank (CX02148-BLK1)

Prepared & Analyzed: 03/27/14

Gasoline	ND	10	50	µg/L							
----------	----	----	----	------	--	--	--	--	--	--	--

Surrogate: Toluene-d8

9.11

"

10.0

91

65-135

LCS (CX02148-BS1)

Prepared & Analyzed: 03/27/14

Gasoline	448	10	50	µg/L	500		90	70-130			
----------	-----	----	----	------	-----	--	----	--------	--	--	--

Surrogate: Toluene-d8

8.82

"

10.0

88

65-135

LCS Dup (CX02148-BSD1)

Prepared & Analyzed: 03/27/14

Gasoline	491	10	50	µg/L	500		98	70-130	9	30	
----------	-----	----	----	------	-----	--	----	--------	---	----	--

Surrogate: Toluene-d8

8.75

"

10.0

88

65-135

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

Notes and Definitions

J Detected but below the Reporting Limit; therefore, result is an estimated concentration.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

[illegible]

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04/02/14 10:08

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q1 2014 NASA RGRP Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1042
COC #:

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

02 April 2014

CLS Work Order #: CXC1043

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

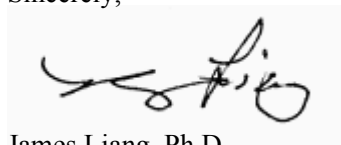
Moffet Field, CA 94053-1000

Project Name: AOI4 O&M

Enclosed are the results of analyses for samples received by the laboratory on 03/26/14 16:45. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed below as well as under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is written over a light gray rectangular background.

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

04/02/14 10:09

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXC1043-01) Water Sampled: 03/26/14 09:40 Received: 03/26/14 16:45										
<i>Surrogate: o-Terphenyl</i>	89 %		65-135	mg/L		CX02208	04/01/14	04/02/14	EPA 8015M	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	0.30	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	
TANK1-E (CXC1043-02) Water Sampled: 03/26/14 10:15 Received: 03/26/14 16:45										
<i>Surrogate: o-Terphenyl</i>	86 %		65-135	mg/L		CX02208	04/01/14	04/02/14	EPA 8015M	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	ND	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	
15A11A (CXC1043-03) Water Sampled: 03/26/14 10:35 Received: 03/26/14 16:45										
<i>Surrogate: o-Terphenyl</i>	99 %		65-135	mg/L		CX02208	04/01/14	04/02/14	EPA 8015M	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	0.32	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	

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04/02/14 10:09

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXC1043-01) Water Sampled: 03/26/14 09:40 Received: 03/26/14 16:45										
<i>Surrogate: o-Chlorotoluene (Gas)</i>	95 %		65-135	µg/L		CX02172	03/27/14	03/27/14	EPA 8015M	
Gasoline	110	10	50	"	1	"	"	"	"	
TANK1-E (CXC1043-02) Water Sampled: 03/26/14 10:15 Received: 03/26/14 16:45										
<i>Surrogate: o-Chlorotoluene (Gas)</i>	83 %		65-135	µg/L		CX02172	03/27/14	03/27/14	EPA 8015M	
Gasoline	ND	10	50	"	1	"	"	"	"	
15A11A (CXC1043-03) Water Sampled: 03/26/14 10:35 Received: 03/26/14 16:45										
<i>Surrogate: o-Chlorotoluene (Gas)</i>	90 %		65-135	µg/L		CX02172	03/27/14	03/27/14	EPA 8015M	
Gasoline	100	10	50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXC1043-01) Water Sampled: 03/26/14 09:40 Received: 03/26/14 16:45										
<i>Surrogate: Toluene-d8</i>	<i>102 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX02150</i>	<i>03/27/14</i>	<i>03/27/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.061	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.045	0.50	"	1	"	"	"	"	
Toluene	ND	0.073	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.23	1.0	"	1	"	"	"	"	
TANK1-E (CXC1043-02) Water Sampled: 03/26/14 10:15 Received: 03/26/14 16:45										
<i>Surrogate: Toluene-d8</i>	<i>98 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX02150</i>	<i>03/27/14</i>	<i>03/27/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.061	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.045	0.50	"	1	"	"	"	"	
Toluene	ND	0.073	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.23	1.0	"	1	"	"	"	"	
15A11A (CXC1043-03) Water Sampled: 03/26/14 10:35 Received: 03/26/14 16:45										
<i>Surrogate: Toluene-d8</i>	<i>102 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX02150</i>	<i>03/27/14</i>	<i>03/27/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.061	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.045	0.50	"	1	"	"	"	"	
Toluene	ND	0.073	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.23	1.0	"	1	"	"	"	"	

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04/02/14 10:09

Earth Resource Technologies c/o NASA-Ames
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Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX02208 - EPA 3510B GCNV

Blank (CX02208-BLK1)

Prepared: 04/01/14 Analyzed: 04/02/14

Surrogate: o-Terphenyl	0.0411			mg/L	0.0500		82	65-135			
Diesel	ND	0.0021	0.050	"							
Motor Oil	ND	0.0091	0.050	"							
Hydraulic Oil	ND	0.030	0.050	"							
Mineral Oil	ND	0.020	0.050	"							
Kerosene	ND	0.0036	0.050	"							
JP-5/JP-8	ND	0.020	0.050	"							

LCS (CX02208-BS1)

Prepared: 04/01/14 Analyzed: 04/02/14

Surrogate: o-Terphenyl	0.0528			mg/L	0.0500		106	65-135			
Diesel	3.07	0.0021	0.050	"	2.50		123	65-135			

LCS Dup (CX02208-BS1)

Prepared: 04/01/14 Analyzed: 04/02/14

Surrogate: o-Terphenyl	0.0509			mg/L	0.0500		102	65-135			
Diesel	3.00	0.0021	0.050	"	2.50		120	65-135	2	30	

Matrix Spike (CX02208-MS1)

Source: CXC1151-01

Prepared: 04/01/14 Analyzed: 04/02/14

Surrogate: o-Terphenyl	0.0544			mg/L	0.0500		109	65-135			
Diesel	2.95	0.0021	0.050	"	2.50	ND	118	46-137			

Matrix Spike Dup (CX02208-MS1)

Source: CXC1151-01

Prepared: 04/01/14 Analyzed: 04/02/14

Surrogate: o-Terphenyl	0.0435			mg/L	0.0500		87	65-135			
Diesel	2.92	0.0021	0.050	"	2.50	ND	117	46-137	1	30	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

TPH-Gasoline by GC FID - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch CX02172 - EPA 5030 Water GC

Blank (CX02172-BLK1)

Prepared & Analyzed: 03/27/14

Surrogate: o-Chlorotoluene (Gas)	16.6			µg/L	20.0		83	65-135			
Gasoline	ND	10	50	"							

LCS (CX02172-BS1)

Prepared & Analyzed: 03/27/14

Surrogate: o-Chlorotoluene (Gas)	18.9			µg/L	20.0		94	65-135			
Gasoline	542	10	50	"	500		108	70-130			

LCS Dup (CX02172-BSD1)

Prepared & Analyzed: 03/27/14

Surrogate: o-Chlorotoluene (Gas)	17.9			µg/L	20.0		89	65-135			
Gasoline	542	10	50	"	500		108	70-130	0.1	30	

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04/02/14 10:09

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

Volatile Organic Compounds by EPA Method 8260B - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	----------------	-----	--------------	-------

Batch CX02150 - EPA 5030 Water MS

Blank (CX02150-BLK1)

Prepared & Analyzed: 03/27/14

Surrogate: Toluene-d8	9.77			µg/L	10.0		98	72-125		
Benzene	ND	0.061	0.50	"						
Toluene	ND	0.073	0.50	"						
Ethylbenzene	ND	0.045	0.50	"						
Xylenes (total)	ND	0.23	1.0	"						

LCS (CX02150-BS1)

Prepared & Analyzed: 03/27/14

Surrogate: Toluene-d8	10.4			µg/L	10.0		104	72-125		
Benzene	21.6	0.061	0.50	"	20.0		108	60-135		
Toluene	21.6	0.073	0.50	"	20.0		108	60-137		

LCS Dup (CX02150-BSD1)

Prepared & Analyzed: 03/27/14

Surrogate: Toluene-d8	10.1			µg/L	10.0		101	72-125		
Benzene	21.7	0.061	0.50	"	20.0		109	60-135	0.6	25
Toluene	21.6	0.073	0.50	"	20.0		108	60-137	0.3	25

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04/02/14 10:09

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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04/02/14 10:09

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI4 O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXC1043
COC #:

[illegible]



Quarter 2, 2014

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

July 02, 2014

CLS Work Order #: CXF1021
COC #:

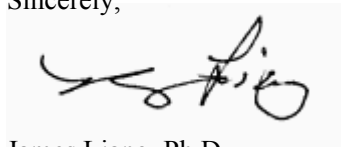
Brian Reddig
Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project Name: AOI 7 & 9

Enclosed are the results of analyses for samples received by the laboratory on 06/25/14 17:05. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Liang', is placed over a light gray rectangular background.

James Liang, Ph.D.
Laboratory Director

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Page 1 of 13

07/02/14 14:45

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

[illegible]

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07/02/14 14:45

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA - 1A (CXF1021-01) Water Sampled: 06/24/14 09:18 Received: 06/25/14 17:05									
Diesel	ND	0.050	mg/L	1	CX04435	06/30/14	07/01/14	EPA 8015M	
Motor Oil	ND	0.050	"	"	"	"	"	"	
JP-5/JP-8	ND	0.050	"	"	"	"	"	"	
<i>Surrogate: o-Terphenyl</i>		<i>100 %</i>	<i>65-135</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

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Page 3 of 13

07/02/14 14:45

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA - 1A (CXF1021-01) Water Sampled: 06/24/14 09:18 Received: 06/25/14 17:05									
Benzene	ND	0.30	µg/L	1	CX04384	06/26/14	06/26/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	3.3	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	2.8	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	38	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	41	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA - 1A (CXF1021-01) Water Sampled: 06/24/14 09:18 Received: 06/25/14 17:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX04384	"	06/26/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	1.5	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

122 % 65-135

"

"

"

"

Surrogate: Toluene-d8

102 % 72-125

"

"

"

"

Surrogate: 4-Bromofluorobenzene

103 % 73-125

"

"

"

"

NASA - 3A (CXF1021-02) Water

Sampled: 06/24/14 09:12 Received: 06/25/14 17:05

Benzene	ND	0.30	µg/L	1	CX04384	06/26/14	06/26/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	0.56	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	5.7	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	19	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	1.4	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA - 3A (CXF1021-02) Water Sampled: 06/24/14 09:12 Received: 06/25/14 17:05									
1,2-Dichloropropane	ND	0.50	µg/L	1	CX04384	"	06/26/14	EPA 624	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	11	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	2.0	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	2.5	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>121 %</i>	<i>65-135</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>Surrogate: Toluene-d8</i>	<i>105 %</i>	<i>72-125</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>107 %</i>	<i>73-125</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

TPH-Gasoline by GC FID

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA - 1A (CXF1021-01) Water Sampled: 06/24/14 09:18 Received: 06/25/14 17:05									
Gasoline	63	50	µg/L	1	CX04455	06/30/14	06/30/14	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		98 %	65-135		"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CX04435 - EPA 3510B GCNV										
Blank (CX04435-BLK1)				Prepared: 06/30/14 Analyzed: 07/01/14						
Diesel	ND	0.050	mg/L							
Motor Oil	ND	0.050	"							
JP-5/JP-8	ND	0.050	"							
Surrogate: o-Terphenyl	0.0294		"	0.0250		118	65-135			
LCS (CX04435-BS1)				Prepared: 06/30/14 Analyzed: 07/01/14						
Diesel	2.00	0.050	mg/L	2.50		80	65-135			
Surrogate: o-Terphenyl	0.0312		"	0.0250		125	65-135			
LCS Dup (CX04435-BSD1)				Prepared: 06/30/14 Analyzed: 07/01/14						
Diesel	2.03	0.050	mg/L	2.50		81	65-135	2	30	
Surrogate: o-Terphenyl	0.0289		"	0.0250		116	65-135			
Matrix Spike (CX04435-MS1)				Source: CXF0968-01	Prepared: 06/30/14 Analyzed: 07/01/14					
Diesel	2.08	0.050	mg/L	2.50	ND	83	46-137			
Surrogate: o-Terphenyl	0.0310		"	0.0250		124	65-135			
Matrix Spike Dup (CX04435-MSD1)				Source: CXF0968-01	Prepared: 06/30/14 Analyzed: 07/01/14					
Diesel	2.20	0.050	mg/L	2.50	ND	88	46-137	6	30	
Surrogate: o-Terphenyl	0.0316		"	0.0250		126	65-135			

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX04384 - EPA 5030 Water MS

Blank (CX04384-BLK1)

Prepared & Analyzed: 06/26/14

Benzene	ND	0.30	µg/L
Bromodichloromethane	ND	0.50	"
Bromoform	ND	0.50	"
Bromomethane	ND	0.50	"
Carbon tetrachloride	ND	0.50	"
Chlorobenzene	ND	0.30	"
Chloroethane	ND	0.50	"
2-Chloroethylvinyl ether	ND	2.0	"
Chloroform	ND	0.50	"
Chloromethane	ND	0.50	"
Dibromochloromethane	ND	0.50	"
1,2-Dichlorobenzene	ND	0.30	"
1,3-Dichlorobenzene	ND	0.30	"
1,4-Dichlorobenzene	ND	0.30	"
Dichlorodifluoromethane (Freon 12)	ND	0.50	"
1,1-Dichloroethane	ND	0.50	"
1,2-Dichloroethane	ND	0.50	"
1,1-Dichloroethene	ND	0.50	"
cis-1,2-Dichloroethene	ND	0.50	"
trans-1,2-Dichloroethene	ND	0.50	"
1,2-Dichloropropane	ND	0.50	"
cis-1,3-Dichloropropene	ND	0.50	"
trans-1,3-Dichloropropene	ND	0.50	"
Ethylbenzene	ND	0.30	"
Methylene chloride	ND	0.50	"
1,1,2,2-Tetrachloroethane	ND	0.50	"
Tetrachloroethene	ND	0.50	"
Toluene	ND	0.30	"
1,1,1-Trichloroethane	ND	0.50	"
1,1,2-Trichloroethane	ND	0.50	"
Trichloroethene	ND	0.50	"

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX04384 - EPA 5030 Water MS

Blank (CX04384-BLK1)

Prepared & Analyzed: 06/26/14

Trichlorofluoromethane	ND	0.50	µg/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"							
Vinyl chloride	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	11.0		"	10.0		110	65-135			
Surrogate: Toluene-d8	10.2		"	10.0		102	72-125			
Surrogate: 4-Bromofluorobenzene	10.3		"	10.0		103	73-125			

LCS (CX04384-BS1)

Prepared & Analyzed: 06/26/14

Benzene	22.9	0.30	µg/L	20.0		115	37-151			
Bromodichloromethane	22.7	0.50	"	20.0		113	35-155			
Bromoform	19.6	0.50	"	20.0		98	45-169			
Bromomethane	22.9	0.50	"	20.0		114	10-242			
Carbon tetrachloride	23.7	0.50	"	20.0		118	70-140			
Chlorobenzene	18.3	0.30	"	20.0		91	37-160			
Chloroethane	21.2	0.50	"	20.0		106	14-230			
Chloroform	22.0	0.50	"	20.0		110	51-138			
Chloromethane	21.0	0.50	"	20.0		105	10-273			
Dibromochloromethane	23.5	0.50	"	20.0		118	53-149			
1,2-Dichlorobenzene	17.1	0.30	"	20.0		86	18-190			
1,3-Dichlorobenzene	17.4	0.30	"	20.0		87	59-156			
1,4-Dichlorobenzene	16.9	0.30	"	20.0		85	18-190			
Dichlorodifluoromethane (Freon 12)	20.0	0.50	"	20.0		100	50-150			
1,1-Dichloroethane	21.8	0.50	"	20.0		109	59-155			
1,2-Dichloroethane	21.7	0.50	"	20.0		109	49-155			
1,1-Dichloroethene	21.4	0.50	"	20.0		107	5-234			
trans-1,2-Dichloroethene	20.8	0.50	"	20.0		104	54-156			
1,2-Dichloropropane	22.4	0.50	"	20.0		112	5-210			
cis-1,3-Dichloropropene	22.6	0.50	"	20.0		113	5-227			
trans-1,3-Dichloropropene	24.1	0.50	"	20.0		121	17-183			
Ethylbenzene	20.3	0.30	"	20.0		101	37-162			

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX04384 - EPA 5030 Water MS

LCS (CX04384-BS1)

Prepared & Analyzed: 06/26/14

Methylene chloride	22.2	0.50	µg/L	20.0		111	5-221			
1,1,2,2-Tetrachloroethane	16.4	0.50	"	20.0		82	46-148			
Tetrachloroethene	23.9	0.50	"	20.0		119	64-148			
Toluene	22.8	0.30	"	20.0		114	47-150			
1,1,1-Trichloroethane	21.5	0.50	"	20.0		108	52-162			
1,1,2-Trichloroethane	22.3	0.50	"	20.0		112	52-150			
Trichloroethene	23.0	0.50	"	20.0		115	71-157			
Trichlorofluoromethane	21.6	0.50	"	20.0		108	47-181			
Vinyl chloride	22.4	0.50	"	20.0		112	10-251			
Surrogate: 1,2-Dichloroethane-d4	10.6		"	10.0		106	65-135			
Surrogate: Toluene-d8	10.5		"	10.0		105	72-125			
Surrogate: 4-Bromofluorobenzene	10.0		"	10.0		100	73-125			

LCS Dup (CX04384-BSD1)

Prepared & Analyzed: 06/26/14

Benzene	22.5	0.30	µg/L	20.0		112	37-151	2	30	
Bromodichloromethane	22.3	0.50	"	20.0		112	35-155	2	30	
Bromoform	18.2	0.50	"	20.0		91	45-169	8	30	
Bromomethane	19.1	0.50	"	20.0		96	10-242	18	30	
Carbon tetrachloride	21.7	0.50	"	20.0		109	70-140	9	30	
Chlorobenzene	17.5	0.30	"	20.0		88	37-160	4	30	
Chloroethane	22.2	0.50	"	20.0		111	14-230	5	30	
Chloroform	22.2	0.50	"	20.0		111	51-138	1	30	
Chloromethane	19.8	0.50	"	20.0		99	10-273	6	30	
Dibromochloromethane	23.5	0.50	"	20.0		117	53-149	0.4	30	
1,2-Dichlorobenzene	17.4	0.30	"	20.0		87	18-190	2	30	
1,3-Dichlorobenzene	17.7	0.30	"	20.0		89	59-156	2	30	
1,4-Dichlorobenzene	17.1	0.30	"	20.0		85	18-190	0.7	30	
Dichlorodifluoromethane (Freon 12)	17.8	0.50	"	20.0		89	50-150	12	30	
1,1-Dichloroethane	23.1	0.50	"	20.0		115	59-155	6	30	
1,2-Dichloroethane	21.0	0.50	"	20.0		105	49-155	4	30	
1,1-Dichloroethene	22.3	0.50	"	20.0		111	5-234	4	30	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX04384 - EPA 5030 Water MS

LCS Dup (CX04384-BSD1)

Prepared & Analyzed: 06/26/14

trans-1,2-Dichloroethene	19.0	0.50	µg/L	20.0		95	54-156	9	30	
1,2-Dichloropropane	22.3	0.50	"	20.0		111	5-210	0.5	30	
cis-1,3-Dichloropropene	22.4	0.50	"	20.0		112	5-227	1	30	
trans-1,3-Dichloropropene	23.8	0.50	"	20.0		119	17-183	1	30	
Ethylbenzene	19.2	0.30	"	20.0		96	37-162	6	30	
Methylene chloride	27.3	0.50	"	20.0		137	5-221	21	30	
1,1,2,2-Tetrachloroethane	16.6	0.50	"	20.0		83	46-148	0.9	30	
Tetrachloroethene	23.4	0.50	"	20.0		117	64-148	2	30	
Toluene	22.7	0.30	"	20.0		114	47-150	0.4	30	
1,1,1-Trichloroethane	22.0	0.50	"	20.0		110	52-162	2	30	
1,1,2-Trichloroethane	21.5	0.50	"	20.0		108	52-150	4	30	
Trichloroethene	22.7	0.50	"	20.0		113	71-157	1	30	
Trichlorofluoromethane	22.1	0.50	"	20.0		111	47-181	2	30	
Vinyl chloride	20.2	0.50	"	20.0		101	10-251	11	30	
Surrogate: 1,2-Dichloroethane-d4	9.69		"	10.0		97	65-135			
Surrogate: Toluene-d8	10.5		"	10.0		105	72-125			
Surrogate: 4-Bromofluorobenzene	10.0		"	10.0		100	73-125			

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX04455 - EPA 5030 Water GC

Blank (CX04455-BLK1)

Prepared & Analyzed: 06/30/14

JP-4	ND	50	µg/L							
Gasoline	ND	50	"							
Surrogate: o-Chlorotoluene (Gas)	19.7		"	20.0		98	65-135			

LCS (CX04455-BS1)

Prepared & Analyzed: 06/30/14

Gasoline	452	50	µg/L	500		90	70-130			
Surrogate: o-Chlorotoluene (Gas)	20.2		"	20.0		101	65-135			

LCS Dup (CX04455-BSD1)

Prepared & Analyzed: 06/30/14

Gasoline	485	50	µg/L	500		97	70-130	7	30	
Surrogate: o-Chlorotoluene (Gas)	20.4		"	20.0		102	65-135			

CALIFORNIA LABORATORY SERVICES

Page 13 of 13

07/02/14 14:45

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 7 & 9
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1021
COC #:

Notes and Definitions

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

July 02, 2014

CLS Work Order #: CXF1018

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

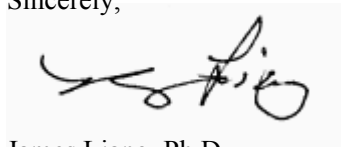
Moffet Field, CA 94053-1000

Project Name: AOI 4 Quarterly O&M

Enclosed are the results of analyses for samples received by the laboratory on 06/25/14 17:05. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is written over a light gray rectangular background.

James Liang, Ph.D.

Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

Page 1 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY										CLS ID. NO. <u>CXF1018</u> (of)		
Report To:				Client Job Number 3602-705				ANALYSIS REQUESTED				
Name and Address Earth Resources Technology, Inc.				Destination Laboratory				GEOTRACKER				
NASA Ames Research Center				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com <input type="checkbox"/> OTHER				EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO				
Moffett Field, CA								GLOBAL ID.				
Project Manager Brian Reddig (650) 604-1315								FIELD CONDITIONS:				
Project Name AOI 4 Quarterly O&M								COMPOSITE:				
Sampled By Brian Reddig								TURNAROUND TIME IN DAYS				
Job Description Q2 2014 Sampling				SPECIAL INSTRUCTIONS								
Site Location Area of Investigation 4												
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE	TPH-G/BTEX	TPH-D, -JP5/B, -MO	1	2	5	10
6/25/14	8:22	15K11A		Groundwater	4	Mixed	1,3	X X				X
6/25/14	8:52	TANK1-E		Groundwater	4	Mixed	1,3	X X				X
6/25/14	9:32	15A11A		Groundwater	4	mixed	1,3	X X				X
INVOICE TO:												
PO#												
QUOTE#												
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME			PRESERVATIVES (1) HCL (3) = COLD (2) HNO ₃ (4)		
RELINQUISHED BY (Signature)				PRINT NAME/COMPANY			DATE/TIME			RECEIVED BY (Signature)		
<i>Brian Reddig</i>				Brian Reddig/ERT			6/25/14 1:40			<i>CV</i>		
RECEIVED AT LAB BY:				DATE/TIME: 6/25/14 1:40			CONDITIONS/COMMENTS: 2.0					
SHIPPED BY:				DATE/TIME: 6/25/14 1:40			AIR BILL #					
<input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER				CL								

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

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916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

Page 2 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXF1018-01) Water Sampled: 06/25/14 08:22 Received: 06/25/14 17:05									
Diesel	ND	0.050	mg/L	1	CX04435	06/30/14	07/01/14	EPA 8015M	
Motor Oil	ND	0.050	"	"	"	"	"	"	
JP-5/JP-8	0.36	0.050	"	"	"	"	"	"	
<i>Surrogate: o-Terphenyl</i>									
		120 %	65-135		"	"	"	"	
Tank1-E (CXF1018-02) Water Sampled: 06/25/14 08:52 Received: 06/25/14 17:05									
Diesel	ND	0.050	mg/L	1	CX04435	06/30/14	07/01/14	EPA 8015M	
Motor Oil	ND	0.050	"	"	"	"	"	"	
JP-5/JP-8	ND	0.050	"	"	"	"	"	"	
<i>Surrogate: o-Terphenyl</i>									
		95 %	65-135		"	"	"	"	
15A11A (CXF1018-03) Water Sampled: 06/25/14 09:32 Received: 06/25/14 17:05									
Diesel	ND	0.050	mg/L	1	CX04435	06/30/14	07/01/14	EPA 8015M	
Motor Oil	ND	0.050	"	"	"	"	"	"	
JP-5/JP-8	0.29	0.050	"	"	"	"	"	"	
<i>Surrogate: o-Terphenyl</i>									
		114 %	65-135		"	"	"	"	

CALIFORNIA LABORATORY SERVICES

Page 3 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

TPH-Gasoline by GC FID

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXF1018-01) Water Sampled: 06/25/14 08:22 Received: 06/25/14 17:05									
Gasoline	180	50	µg/L	1	CX04455	06/30/14	06/30/14	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		115 %	65-135		"	"	"	"	
Tank1-E (CXF1018-02) Water Sampled: 06/25/14 08:52 Received: 06/25/14 17:05									
Gasoline	ND	50	µg/L	1	CX04455	06/30/14	06/30/14	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		98 %	65-135		"	"	"	"	
15A11A (CXF1018-03) Water Sampled: 06/25/14 09:32 Received: 06/25/14 17:05									
Gasoline	150	50	µg/L	1	CX04455	06/30/14	06/30/14	EPA 8015M	
Surrogate: o-Chlorotoluene (Gas)		112 %	65-135		"	"	"	"	

CALIFORNIA LABORATORY SERVICES

Page 4 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXF1018-01) Water Sampled: 06/25/14 08:22 Received: 06/25/14 17:05									
Benzene	ND	0.50	µg/L	1	CX04384	06/26/14	06/26/14	EPA 8260B	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	
<i>Surrogate: Toluene-d8</i> 114 % 72-125 " " " "									
Tank1-E (CXF1018-02) Water Sampled: 06/25/14 08:52 Received: 06/25/14 17:05									
Benzene	ND	0.50	µg/L	1	CX04384	06/26/14	06/26/14	EPA 8260B	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	
<i>Surrogate: Toluene-d8</i> 106 % 72-125 " " " "									
15A11A (CXF1018-03) Water Sampled: 06/25/14 09:32 Received: 06/25/14 17:05									
Benzene	ND	0.50	µg/L	1	CX04384	06/26/14	06/26/14	EPA 8260B	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	
<i>Surrogate: Toluene-d8</i> 108 % 72-125 " " " "									

CALIFORNIA LABORATORY SERVICES

Page 5 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CX04435 - EPA 3510B GCNV										
Blank (CX04435-BLK1)				Prepared: 06/30/14 Analyzed: 07/01/14						
Diesel	ND	0.050	mg/L							
Motor Oil	ND	0.050	"							
JP-5/JP-8	ND	0.050	"							
Surrogate: o-Terphenyl	0.0294		"	0.0250		118	65-135			
LCS (CX04435-BS1)				Prepared: 06/30/14 Analyzed: 07/01/14						
Diesel	2.00	0.050	mg/L	2.50		80	65-135			
Surrogate: o-Terphenyl	0.0312		"	0.0250		125	65-135			
LCS Dup (CX04435-BSD1)				Prepared: 06/30/14 Analyzed: 07/01/14						
Diesel	2.03	0.050	mg/L	2.50		81	65-135	2	30	
Surrogate: o-Terphenyl	0.0289		"	0.0250		116	65-135			
Matrix Spike (CX04435-MS1)				Source: CXF0968-01		Prepared: 06/30/14 Analyzed: 07/01/14				
Diesel	2.08	0.050	mg/L	2.50	ND	83	46-137			
Surrogate: o-Terphenyl	0.0310		"	0.0250		124	65-135			
Matrix Spike Dup (CX04435-MSD1)				Source: CXF0968-01		Prepared: 06/30/14 Analyzed: 07/01/14				
Diesel	2.20	0.050	mg/L	2.50	ND	88	46-137	6	30	
Surrogate: o-Terphenyl	0.0316		"	0.0250		126	65-135			

CALIFORNIA LABORATORY SERVICES

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07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

TPH-Gasoline by GC FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX04455 - EPA 5030 Water GC

Blank (CX04455-BLK1)

Prepared & Analyzed: 06/30/14

JP-4	ND	50	µg/L							
Gasoline	ND	50	"							
Surrogate: o-Chlorotoluene (Gas)	19.7		"	20.0		98	65-135			

LCS (CX04455-BS1)

Prepared & Analyzed: 06/30/14

Gasoline	452	50	µg/L	500		90	70-130			
Surrogate: o-Chlorotoluene (Gas)	20.2		"	20.0		101	65-135			

LCS Dup (CX04455-BSD1)

Prepared & Analyzed: 06/30/14

Gasoline	485	50	µg/L	500		97	70-130	7	30	
Surrogate: o-Chlorotoluene (Gas)	20.4		"	20.0		102	65-135			

CALIFORNIA LABORATORY SERVICES

Page 7 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX04384 - EPA 5030 Water MS

Blank (CX04384-BLK1)

Prepared & Analyzed: 06/26/14

Di-isopropyl ether	ND	0.50	µg/L							
Ethyl tert-butyl ether	ND	0.50	"							
Methyl tert-butyl ether	ND	0.50	"							
tert-Amyl methyl ether	ND	0.50	"							
tert-Butyl alcohol	ND	5.0	"							
Surrogate: Toluene-d8	10.2		"	10.0		102	72-125			

LCS (CX04384-BS1)

Prepared & Analyzed: 06/26/14

Methyl tert-butyl ether	22.1	0.50	µg/L	20.0		111	52-130			
Benzene	22.9	0.50	"	20.0		115	52-130			
Surrogate: Toluene-d8	10.5		"	10.0		105	72-125			

LCS Dup (CX04384-BSD1)

Prepared & Analyzed: 06/26/14

Methyl tert-butyl ether	20.9	0.50	µg/L	20.0		104	52-130	6	30	
Benzene	22.5	0.50	"	20.0		112	52-130	2	30	
Surrogate: Toluene-d8	10.5		"	10.0		105	72-125			

CALIFORNIA LABORATORY SERVICES

Page 8 of 8

07/02/14 13:55

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXF1018
COC #:

Notes and Definitions

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



Quarter 3, 2014

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

08 October 2014

CLS Work Order #: CXJ0062

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

Moffet Field, CA 94053-1000

Project Name: 2014 Annual NASA RGRP Groundwater Sample

Enclosed are the results of analyses for samples received by the laboratory on 10/01/14 17:05. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is written over a light gray rectangular background.

James Liang, Ph.D.

Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M03A (CXJ0062-04) Water Sampled: 09/29/14 08:56 Received: 10/01/14 17:05											
Total Dissolved Solids	JB	810	10	10	mg/L	1	CX06998	10/02/14	10/03/14	SM2540C	
W08-08A1 (CXJ0062-14) Water Sampled: 09/29/14 15:04 Received: 10/01/14 17:05											
Total Dissolved Solids	JB	800	10	10	mg/L	1	CX06998	10/02/14	10/03/14	SM2540C	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D37A (CXJ0062-09) Water Sampled: 09/29/14 12:25 Received: 10/01/14 17:05											
<i>Surrogate: o-Terphenyl</i>	ahs	109 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M	
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"	
JP-5/JP-8	ahs	0.85	0.020	0.050	"	1	"	"	"	"	
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"	
NASA-1A (CXJ0062-15) Water Sampled: 09/29/14 15:20 Received: 10/01/14 17:05											
<i>Surrogate: o-Terphenyl</i>	ahs	117 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M	
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"	
JP-5/JP-8	ahs	ND	0.020	0.050	"	1	"	"	"	"	
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"	
14D28A (CXJ0062-21) Water Sampled: 09/30/14 09:58 Received: 10/01/14 17:05											
<i>Surrogate: o-Terphenyl</i>	ahs	100 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M	
Motor Oil	ahs	0.54	0.0091	0.050	"	1	"	"	"	"	TPH-X
JP-5/JP-8	ahs	ND	0.020	0.050	"	1	"	"	"	"	
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"	
14C60A (CXJ0062-22) Water Sampled: 09/30/14 10:22 Received: 10/01/14 17:05											
<i>Surrogate: o-Terphenyl</i>	ahs	92 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M	
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"	
JP-5/JP-8	ahs	0.041	0.020	0.050	"	1	"	"	"	"	J
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"	
14D33A (CXJ0062-23) Water Sampled: 09/30/14 10:41 Received: 10/01/14 17:05											
<i>Surrogate: o-Terphenyl</i>	ahs	85 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M	
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"	
JP-5/JP-8	ahs	0.051	0.020	0.050	"	1	"	"	"	"	
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

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916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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14D02A (CXJ0062-24) Water Sampled: 09/30/14 11:05 Received: 10/01/14 17:05

<i>Surrogate: o-Terphenyl</i>	ahs	118 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"
JP-5/JP-8	ahs	ND	0.020	0.050	"	1	"	"	"	"
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"

11N26A (CXJ0062-29) Water Sampled: 09/30/14 17:27 Received: 10/01/14 17:05

<i>Surrogate: o-Terphenyl</i>	ahs	128 %		65-135	mg/L		CX07003	10/02/14	10/07/14	EPA 8015M
Motor Oil	ahs	ND	0.0091	0.050	"	1	"	"	"	"
JP-5/JP-8	ahs	0.59	0.020	0.050	"	1	"	"	"	"
Diesel	ahs	ND	0.0021	0.050	"	1	"	"	"	"

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11K17A (CXJ0062-01) Water Sampled: 09/29/14 07:40 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	87 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	116 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	117 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	1.2	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	19	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	0.63	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	0.33	0.13	0.50	"	1	"	"	"	"	J
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	4.3	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.5	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11K17A (CXJ0062-01) Water Sampled: 09/29/14 07:40 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	0.93	0.15	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
11E02A (CXJ0062-02) Water Sampled: 09/29/14 08:11 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	<i>87 %</i>	<i>72-125</i>		µg/L		<i>CX07090</i>	<i>10/06/14</i>	<i>10/06/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>102 %</i>	<i>73-125</i>		"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>118 %</i>	<i>65-135</i>		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	1.7	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.3	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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11E02A (CXJ0062-02) Water Sampled: 09/29/14 08:11 Received: 10/01/14 17:05

1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

11M25A (CXJ0062-03) Water Sampled: 09/29/14 08:33 Received: 10/01/14 17:05

Surrogate: Toluene-d8	nt	87 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	109 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	116 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	0.89	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	0.72	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	

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3249 Fitzgerald Road Rancho Cordova, CA 95742

www.californialab.com

916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M25A (CXJ0062-03) Water Sampled: 09/29/14 08:33 Received: 10/01/14 17:05											
Bromoform	nt	ND	0.16	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
11M03A (CXJ0062-04) Water Sampled: 09/29/14 08:56 Received: 10/01/14 17:05											
Surrogate: Toluene-d8	nt	89 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	112 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	121 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	1.6	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	22	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.1	0.15	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M03A (CXJ0062-04) Water Sampled: 09/29/14 08:56 Received: 10/01/14 17:05											
Chloromethane	nt	ND	0.29	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Chloroform	nt	0.63	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	7.4	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	2.7	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	2.4	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
11M17A (CXJ0062-05) Water Sampled: 09/29/14 09:20 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	<i>89 %</i>	<i>72-125</i>		µg/L		<i>CX07090</i>	<i>10/06/14</i>	<i>10/06/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>103 %</i>	<i>73-125</i>		"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>122 %</i>	<i>65-135</i>		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	1.3	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	19	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M17A (CXJ0062-05) Water Sampled: 09/29/14 09:20 Received: 10/01/14 17:05											
Ethylbenzene	nt	ND	0.090	0.30	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	0.59	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	4.5	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.5	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	0.95	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M21A (CXJ0062-06) Water Sampled: 09/29/14 09:54 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	88 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	111 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	121 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	1.6	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	16	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	4.0	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	0.40	0.13	0.50	"	1	"	"	"	"	J
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	14	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	3.8	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M21A (CXJ0062-06) Water Sampled: 09/29/14 09:54 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.5	0.15	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
WSI-04A1 (CXJ0062-07) Water Sampled: 09/29/14 10:19 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	<i>91 %</i>		<i>72-125</i>	µg/L		<i>CX07090</i>	<i>10/06/14</i>	<i>10/06/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>108 %</i>		<i>73-125</i>	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>117 %</i>		<i>65-135</i>	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	1.5	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	58	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	0.72	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	0.34	0.13	0.50	"	1	"	"	"	"	J
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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WSI-04A1 (CXJ0062-07) Water Sampled: 09/29/14 10:19 Received: 10/01/14 17:05

1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	2.8	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.3	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.7	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

NASA-3A (CXJ0062-08) Water Sampled: 09/29/14 10:25 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	88 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	102 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	121 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	2.1	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	11	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	0.84	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	0.39	0.13	0.50	"	1	"	"	"	"	J
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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NASA-3A (CXJ0062-08) Water Sampled: 09/29/14 10:25 Received: 10/01/14 17:05

Bromoform	nt	ND	0.16	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	12	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	4.1	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.7	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

14D37A (CXJ0062-09) Water Sampled: 09/29/14 12:25 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	96 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	104 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	119 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	

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3249 Fitzgerald Road Rancho Cordova, CA 95742

www.californialab.com

916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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14D37A (CXJ0062-09) Water Sampled: 09/29/14 12:25 Received: 10/01/14 17:05

Chloromethane	nt	ND	0.29	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

11N22A1 (CXJ0062-10) Water Sampled: 09/29/14 12:53 Received: 10/01/14 17:05

Surrogate: Toluene-d8	nt	87 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	109 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	119 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	62	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	0.81	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11N22A1 (CXJ0062-10) Water Sampled: 09/29/14 12:53 Received: 10/01/14 17:05											
Ethylbenzene	nt	ND	0.090	0.30	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	16	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	0.53	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.7	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.7	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11N22K1 (CXJ0062-11) Water Sampled: 09/29/14 13:13 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	87 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	104 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	113 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	62	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	0.76	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	15	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	0.54	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.6	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11N22K1 (CXJ0062-11) Water Sampled: 09/29/14 13:13 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.9	0.15	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
FB092914 (CXJ0062-12) Water Sampled: 09/29/14 14:30 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	<i>86 %</i>	<i>72-125</i>		µg/L		<i>CX07090</i>	<i>10/06/14</i>	<i>10/06/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>116 %</i>	<i>73-125</i>		"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>119 %</i>	<i>65-135</i>		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
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Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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FB092914 (CXJ0062-12) Water Sampled: 09/29/14 14:30 Received: 10/01/14 17:05

1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

11M16A1 (CXJ0062-13) Water Sampled: 09/29/14 14:33 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	88 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	102 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	121 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	13	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.1	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	

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3249 Fitzgerald Road Rancho Cordova, CA 95742

www.californialab.com

916-638-7301

Fax: 916-638-4510

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M16A1 (CXJ0062-13) Water Sampled: 09/29/14 14:33 Received: 10/01/14 17:05											
Bromoform	nt	ND	0.16	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	0.89	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
W08-08A1 (CXJ0062-14) Water Sampled: 09/29/14 15:04 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	<i>91 %</i>		<i>72-125</i>	µg/L		<i>CX07090</i>	<i>10/06/14</i>	<i>10/06/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>110 %</i>		<i>73-125</i>	"		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>118 %</i>		<i>65-135</i>	"		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	17	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	

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Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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W08-08A1 (CXJ0062-14) Water Sampled: 09/29/14 15:04 Received: 10/01/14 17:05

Chloromethane	nt	ND	0.29	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	1.4	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.0	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.0	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

NASA-1A (CXJ0062-15) Water Sampled: 09/29/14 15:20 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	87 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	106 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	115 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	0.58	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	40	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	0.73	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	

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Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXJ0062-15) Water Sampled: 09/29/14 15:20 Received: 10/01/14 17:05											
Ethylbenzene	nt	ND	0.090	0.30	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	28	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	2.4	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	3.1	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.5	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14E14A (CXJ0062-16) Water Sampled: 09/29/14 17:27 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	88 %		72-125	µg/L		CX07090	10/06/14	10/06/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	105 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	117 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	17	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	17	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	0.58	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14E14A (CXJ0062-16) Water Sampled: 09/29/14 17:27 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	µg/L	1	CX07090	10/06/14	10/06/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
15H05A (CXJ0062-17) Water Sampled: 09/29/14 18:00 Received: 10/01/14 17:05											
Surrogate: Toluene-d8	nt	97 %	72-125		µg/L		CX07130	10/07/14	10/07/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	94 %	73-125		"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	106 %	65-135		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	0.31	0.11	0.50	"	1	"	"	"	"	J
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	0.24	0.10	0.30	"	1	"	"	"	"	J
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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15H05A (CXJ0062-17) Water Sampled: 09/29/14 18:00 Received: 10/01/14 17:05

1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

14D09A (CXJ0062-18) Water Sampled: 09/29/14 18:16 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	98 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	94 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	107 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	1.9	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	41	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	0.68	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	39	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

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www.californialab.com

916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D09A (CXJ0062-18) Water Sampled: 09/29/14 18:16 Received: 10/01/14 17:05											
Bromoform	nt	ND	0.16	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	2.8	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	2.2	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
WNB-08A1 (CXJ0062-19) Water Sampled: 09/30/14 09:15 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	94 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	95 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	104 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	14	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	4.1	0.15	0.50	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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WNB-08A1 (CXJ0062-19) Water Sampled: 09/30/14 09:15 Received: 10/01/14 17:05

Chloromethane	nt	ND	0.29	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	0.82	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

11M24A (CXJ0062-20) Water Sampled: 09/30/14 09:32 Received: 10/01/14 17:05

Surrogate: Toluene-d8	nt	95 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	94 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	106 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	1.0	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11M24A (CXJ0062-20) Water Sampled: 09/30/14 09:32 Received: 10/01/14 17:05											
Ethylbenzene	nt	ND	0.090	0.30	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	2.5	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.6	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	1.2	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D28A (CXJ0062-21) Water Sampled: 09/30/14 09:58 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	96 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	98 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	106 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	1.5	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	16	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	1.3	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	2.5	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	57	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	8.1	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	4.2	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D28A (CXJ0062-21) Water Sampled: 09/30/14 09:58 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	0.69	0.15	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	16	0.18	0.50	"	1	"	"	"	"	
14C60A (CXJ0062-22) Water Sampled: 09/30/14 10:22 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	<i>94 %</i>	<i>72-125</i>		µg/L		<i>CX07130</i>	<i>10/07/14</i>	<i>10/07/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>99 %</i>	<i>73-125</i>		"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>109 %</i>	<i>65-135</i>		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.4	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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14C60A (CXJ0062-22) Water Sampled: 09/30/14 10:22 Received: 10/01/14 17:05

1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

14D33A (CXJ0062-23) Water Sampled: 09/30/14 10:41 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	96 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	99 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	107 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	5.3	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	0.64	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	0.46	0.15	0.50	"	1	"	"	"	"	J
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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14D33A (CXJ0062-23) Water Sampled: 09/30/14 10:41 Received: 10/01/14 17:05

Bromoform	nt	ND	0.16	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.9	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

14D02A (CXJ0062-24) Water Sampled: 09/30/14 11:05 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	<i>102 %</i>		<i>72-125</i>	µg/L		<i>CX07130</i>	<i>10/07/14</i>	<i>10/07/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	<i>96 %</i>		<i>73-125</i>	"		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	<i>107 %</i>		<i>65-135</i>	"		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	0.86	0.15	0.50	"	1	"	"	"	"	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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14D02A (CXJ0062-24) Water Sampled: 09/30/14 11:05 Received: 10/01/14 17:05

Chloromethane	nt	ND	0.29	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

14D25A2 (CXJ0062-25) Water Sampled: 09/30/14 13:44 Received: 10/01/14 17:05

Surrogate: Toluene-d8	nt	99 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	96 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	103 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	13	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D25A2 (CXJ0062-25) Water Sampled: 09/30/14 13:44 Received: 10/01/14 17:05											
Ethylbenzene	nt	ND	0.090	0.30	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.4	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	0.74	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	0.71	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D31A2 (CXJ0062-26) Water Sampled: 09/30/14 14:24 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	96 %		72-125	µg/L		CX07130	10/07/14	10/07/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	94 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	103 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D31A2 (CXJ0062-26) Water Sampled: 09/30/14 14:24 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	
FB093014 (CXJ0062-27) Water Sampled: 09/30/14 14:26 Received: 10/01/14 17:05											
Surrogate: Toluene-d8	nt	98 %	72-125		µg/L		CX07130	10/07/14	10/07/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	100 %	73-125		"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	102 %	65-135		"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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FB093014 (CXJ0062-27) Water Sampled: 09/30/14 14:26 Received: 10/01/14 17:05

1,2-Dichloropropane	nt	ND	0.057	0.50	µg/L	1	CX07130	10/07/14	10/07/14	EPA 624	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

14D13A (CXJ0062-28) Water Sampled: 09/30/14 17:05 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	96 %		72-125	µg/L		CX07130	10/07/14	10/08/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	93 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	108 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	1.7	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	2.2	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	

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www.californialab.com

916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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14D13A (CXJ0062-28) Water Sampled: 09/30/14 17:05 Received: 10/01/14 17:05

Bromoform	nt	ND	0.16	0.50	µg/L	1	CX07130	10/07/14	10/08/14	EPA 624	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	1.1	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

11N26A (CXJ0062-29) Water Sampled: 09/30/14 17:27 Received: 10/01/14 17:05

<i>Surrogate: Toluene-d8</i>	nt	95 %		72-125	µg/L		CX07130	10/07/14	10/08/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	119 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	101 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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11N26A (CXJ0062-29) Water Sampled: 09/30/14 17:27 Received: 10/01/14 17:05

Chloromethane	nt	ND	0.29	0.50	µg/L	1	CX07130	10/07/14	10/08/14	EPA 624	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

11N21A1 (CXJ0062-30) Water Sampled: 09/30/14 17:54 Received: 10/01/14 17:05

Surrogate: Toluene-d8	nt	96 %		72-125	µg/L		CX07130	10/07/14	10/08/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	nt	90 %		73-125	"		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	nt	110 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	0.98	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
11N21A1 (CXJ0062-30) Water Sampled: 09/30/14 17:54 Received: 10/01/14 17:05											
Ethylbenzene	nt	ND	0.090	0.30	µg/L	1	CX07130	10/07/14	10/08/14	EPA 624	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	1.4	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	0.72	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TB093014 (CXJ0062-31) Water Sampled: 09/30/14 18:15 Received: 10/01/14 17:05											
<i>Surrogate: Toluene-d8</i>	nt	97 %		72-125	µg/L		CX07130	10/07/14	10/08/14	EPA 624	
<i>Surrogate: 4-Bromofluorobenzene</i>	nt	99 %		73-125	"		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	nt	104 %		65-135	"		"	"	"	"	
Xylenes (total)	nt	ND	0.35	0.50	"	1	"	"	"	"	
Vinyl chloride	nt	ND	0.17	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Trichloroethene	nt	ND	0.11	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	nt	ND	0.12	0.50	"	1	"	"	"	"	
trans-1,2-Dichloroethene	nt	ND	0.13	0.50	"	1	"	"	"	"	
Toluene	nt	ND	0.10	0.30	"	1	"	"	"	"	
Tetrachloroethene	nt	ND	0.12	0.50	"	1	"	"	"	"	
Methylene chloride	nt	ND	0.24	0.50	"	1	"	"	"	"	
Ethylbenzene	nt	ND	0.090	0.30	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	nt	ND	0.37	0.50	"	1	"	"	"	"	
Dibromochloromethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	nt	ND	0.097	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	nt	ND	0.15	0.50	"	1	"	"	"	"	
Chloromethane	nt	ND	0.29	0.50	"	1	"	"	"	"	
Chloroform	nt	ND	0.13	0.50	"	1	"	"	"	"	
Chloroethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Chlorobenzene	nt	ND	0.11	0.30	"	1	"	"	"	"	
Carbon tetrachloride	nt	ND	0.092	0.50	"	1	"	"	"	"	
Bromomethane	nt	ND	0.20	0.50	"	1	"	"	"	"	
Bromoform	nt	ND	0.16	0.50	"	1	"	"	"	"	
Bromodichloromethane	nt	ND	0.061	0.50	"	1	"	"	"	"	
Benzene	nt	ND	0.057	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	nt	ND	0.11	2.0	"	1	"	"	"	"	
1,4-Dichlorobenzene	nt	ND	0.061	0.30	"	1	"	"	"	"	
1,3-Dichlorobenzene	nt	ND	0.081	0.30	"	1	"	"	"	"	
1,2-Dichloropropane	nt	ND	0.057	0.50	"	1	"	"	"	"	
1,2-Dichloroethane	nt	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	nt	ND	0.042	0.30	"	1	"	"	"	"	
1,1-Dichloroethene	nt	ND	0.092	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	nt	ND	0.12	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	nt	ND	0.098	0.50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TB093014 (CXJ0062-31) Water Sampled: 09/30/14 18:15 Received: 10/01/14 17:05											
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	nt	ND	0.15	0.50	µg/L	1	CX07130	10/07/14	10/08/14	EPA 624	
1,1,2,2-Tetrachloroethane	nt	ND	0.13	0.50	"	1	"	"	"	"	
1,1,1-Trichloroethane	nt	ND	0.18	0.50	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

TPH-Gasoline by GC FID

Analyte	Analyst	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
14D37A (CXJ0062-09) Water Sampled: 09/29/14 12:25 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	124 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	240	10	50	"	1	"	"	"	"	
NASA-1A (CXJ0062-15) Water Sampled: 09/29/14 15:20 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	98 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	44	10	50	"	1	"	"	"	"	J
14D28A (CXJ0062-21) Water Sampled: 09/30/14 09:58 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	94 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	37	10	50	"	1	"	"	"	"	J
14C60A (CXJ0062-22) Water Sampled: 09/30/14 10:22 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	99 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	440	10	50	"	1	"	"	"	"	
14D33A (CXJ0062-23) Water Sampled: 09/30/14 10:41 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	94 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	49	10	50	"	1	"	"	"	"	J
14D02A (CXJ0062-24) Water Sampled: 09/30/14 11:05 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	96 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	76	10	50	"	1	"	"	"	"	
11N26A (CXJ0062-29) Water Sampled: 09/30/14 17:27 Received: 10/01/14 17:05											
Surrogate: o-Chlorotoluene (Gas)	PF	123 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	PF	200	10	50	"	1	"	"	"	"	

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Fax: 916-638-4510

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD Limit	Notes
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Batch CX06998 - General Preparation

Blank (CX06998-BLK1)

Prepared: 10/02/14 Analyzed: 10/03/14

Total Dissolved Solids	ND	10	10	mg/L
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Duplicate (CX06998-DUP1)

Source: CXJ0016-03

Prepared: 10/02/14 Analyzed: 10/03/14

Total Dissolved Solids	464	10	10	mg/L	477	3	20
------------------------	-----	----	----	------	-----	---	----

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07003 - EPA 3510B GCNV

Blank (CX07003-BLK1)

Prepared: 10/02/14 Analyzed: 10/07/14

JP-5/JP-8	ND	0.020	0.050	mg/L							
Motor Oil	ND	0.0091	0.050	"							
Diesel	ND	0.0021	0.050	"							

Surrogate: o-Terphenyl	0.0229			"	0.0250		92	65-135			
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LCS (CX07003-BS1)

Prepared: 10/02/14 Analyzed: 10/07/14

Diesel	2.11	0.0021	0.050	mg/L	2.50		84	65-135			
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Surrogate: o-Terphenyl	0.0272			"	0.0250		109	65-135			
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LCS Dup (CX07003-BS1)

Prepared: 10/02/14 Analyzed: 10/07/14

Diesel	2.22	0.0021	0.050	mg/L	2.50		89	65-135	5	30	
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Surrogate: o-Terphenyl	0.0233			"	0.0250		93	65-135			
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Matrix Spike (CX07003-MS1)

Source: CX11384-01

Prepared: 10/02/14 Analyzed: 10/07/14

Diesel	2.41	0.0021	0.050	mg/L	2.50	ND	96	46-137			
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Surrogate: o-Terphenyl	0.0251			"	0.0250		100	65-135			
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Matrix Spike Dup (CX07003-MSD1)

Source: CX11384-01

Prepared: 10/02/14 Analyzed: 10/07/14

Diesel	2.17	0.0021	0.050	mg/L	2.50	ND	87	46-137	10	30	
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Surrogate: o-Terphenyl	0.0247			"	0.0250		99	65-135			
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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07090 - EPA 5030 Water MS

Blank (CX07090-BLK1)

Prepared & Analyzed: 10/06/14

Xylenes (total)	ND	0.35	0.50	µg/L
Vinyl chloride	ND	0.17	0.50	"
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.15	0.50	"
Trichlorofluoromethane	ND	0.20	0.50	"
Trichloroethene	ND	0.11	0.50	"
1,1,2-Trichloroethane	ND	0.098	0.50	"
1,1,1-Trichloroethane	ND	0.18	0.50	"
Toluene	ND	0.10	0.30	"
Tetrachloroethene	ND	0.12	0.50	"
1,1,2,2-Tetrachloroethane	ND	0.13	0.50	"
Methylene chloride	ND	0.24	0.50	"
Ethylbenzene	ND	0.090	0.30	"
trans-1,3-Dichloropropene	ND	0.12	0.50	"
cis-1,3-Dichloropropene	ND	0.097	0.50	"
1,2-Dichloropropane	ND	0.057	0.50	"
trans-1,2-Dichloroethene	ND	0.13	0.50	"
cis-1,2-Dichloroethene	ND	0.15	0.50	"
1,1-Dichloroethene	ND	0.092	0.50	"
1,2-Dichloroethane	ND	0.054	0.50	"
1,1-Dichloroethane	ND	0.12	0.50	"
Dichlorodifluoromethane (Freon 12)	ND	0.37	0.50	"
1,4-Dichlorobenzene	ND	0.061	0.30	"
1,3-Dichlorobenzene	ND	0.081	0.30	"
1,2-Dichlorobenzene	ND	0.042	0.30	"
Dibromochloromethane	ND	0.13	0.50	"
Chloromethane	ND	0.29	0.50	"
Chloroform	ND	0.13	0.50	"
2-Chloroethylvinyl ether	ND	0.11	2.0	"
Chloroethane	ND	0.20	0.50	"
Chlorobenzene	ND	0.11	0.30	"
Carbon tetrachloride	ND	0.092	0.50	"
Bromomethane	ND	0.20	0.50	"
Bromoform	ND	0.16	0.50	"
Bromodichloromethane	ND	0.061	0.50	"
Benzene	ND	0.057	0.30	"

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07090 - EPA 5030 Water MS

Blank (CX07090-BLK1)

Prepared & Analyzed: 10/06/14

Surrogate: 4-Bromofluorobenzene	11.6			µg/L	10.0		116	73-125			
Surrogate: Toluene-d8	8.70			"	10.0		87	72-125			
Surrogate: 1,2-Dichloroethane-d4	11.5			"	10.0		115	65-135			

LCS (CX07090-BS1)

Prepared & Analyzed: 10/06/14

Vinyl chloride	19.9	0.17	0.50	µg/L	20.0		100	10-251			
Trichlorofluoromethane	21.8	0.20	0.50	"	20.0		109	47-181			
Trichloroethene	19.8	0.11	0.50	"	20.0		99	71-157			
1,1,2-Trichloroethane	20.3	0.098	0.50	"	20.0		101	52-150			
1,1,1-Trichloroethane	24.5	0.18	0.50	"	20.0		122	52-162			
Toluene	20.6	0.10	0.30	"	20.0		103	47-150			
Tetrachloroethene	19.5	0.12	0.50	"	20.0		98	64-148			
1,1,2,2-Tetrachloroethane	21.0	0.13	0.50	"	20.0		105	46-148			
Methylene chloride	23.0	0.24	0.50	"	20.0		115	5-221			
Ethylbenzene	22.1	0.090	0.30	"	20.0		111	37-162			
trans-1,3-Dichloropropene	21.3	0.12	0.50	"	20.0		106	17-183			
cis-1,3-Dichloropropene	19.3	0.097	0.50	"	20.0		97	5-227			
1,2-Dichloropropane	19.9	0.057	0.50	"	20.0		100	5-210			
trans-1,2-Dichloroethene	23.3	0.13	0.50	"	20.0		116	54-156			
1,1-Dichloroethene	21.8	0.092	0.50	"	20.0		109	5-234			
1,2-Dichloroethane	25.4	0.054	0.50	"	20.0		127	49-155			
1,1-Dichloroethane	24.7	0.12	0.50	"	20.0		124	59-155			
Dichlorodifluoromethane (Freon 12)	16.8	0.37	0.50	"	20.0		84	50-150			
1,4-Dichlorobenzene	20.4	0.061	0.30	"	20.0		102	18-190			
1,3-Dichlorobenzene	20.7	0.081	0.30	"	20.0		103	59-156			
1,2-Dichlorobenzene	20.1	0.042	0.30	"	20.0		100	18-190			
Dibromochloromethane	19.3	0.13	0.50	"	20.0		97	53-149			
Chloromethane	20.0	0.29	0.50	"	20.0		100	10-273			
Chloroform	21.1	0.13	0.50	"	20.0		106	51-138			
Chloroethane	23.5	0.20	0.50	"	20.0		118	14-230			
Chlorobenzene	20.5	0.11	0.30	"	20.0		102	37-160			
Carbon tetrachloride	23.8	0.092	0.50	"	20.0		119	70-140			
Bromomethane	22.2	0.20	0.50	"	20.0		111	10-242			
Bromoform	19.6	0.16	0.50	"	20.0		98	45-169			

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07090 - EPA 5030 Water MS

LCS (CX07090-BS1)

Prepared & Analyzed: 10/06/14

Bromodichloromethane	20.2	0.061	0.50	µg/L	20.0		101	35-155			
Benzene	20.5	0.057	0.30	"	20.0		103	37-151			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>10.1</i>			<i>"</i>	<i>10.0</i>		<i>101</i>	<i>73-125</i>			
<i>Surrogate: Toluene-d8</i>	<i>8.86</i>			<i>"</i>	<i>10.0</i>		<i>89</i>	<i>72-125</i>			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>8.33</i>			<i>"</i>	<i>10.0</i>		<i>83</i>	<i>65-135</i>			

LCS Dup (CX07090-BSD1)

Prepared & Analyzed: 10/06/14

Vinyl chloride	19.1	0.17	0.50	µg/L	20.0		96	10-251	4	30	
Trichlorofluoromethane	23.8	0.20	0.50	"	20.0		119	47-181	9	30	
Trichloroethene	23.0	0.11	0.50	"	20.0		115	71-157	15	30	
1,1,2-Trichloroethane	23.0	0.098	0.50	"	20.0		115	52-150	12	30	
1,1,1-Trichloroethane	25.2	0.18	0.50	"	20.0		126	52-162	3	30	
Toluene	23.4	0.10	0.30	"	20.0		117	47-150	13	30	
Tetrachloroethene	22.4	0.12	0.50	"	20.0		112	64-148	14	30	
1,1,2,2-Tetrachloroethane	20.4	0.13	0.50	"	20.0		102	46-148	3	30	
Methylene chloride	22.6	0.24	0.50	"	20.0		113	5-221	2	30	
Ethylbenzene	24.6	0.090	0.30	"	20.0		123	37-162	11	30	
trans-1,3-Dichloropropene	24.0	0.12	0.50	"	20.0		120	17-183	12	30	
cis-1,3-Dichloropropene	21.9	0.097	0.50	"	20.0		109	5-227	12	30	
1,2-Dichloropropane	23.0	0.057	0.50	"	20.0		115	5-210	14	30	
trans-1,2-Dichloroethene	23.8	0.13	0.50	"	20.0		119	54-156	2	30	
1,1-Dichloroethene	23.2	0.092	0.50	"	20.0		116	5-234	6	30	
1,2-Dichloroethane	25.6	0.054	0.50	"	20.0		128	49-155	0.9	30	
1,1-Dichloroethane	25.2	0.12	0.50	"	20.0		126	59-155	2	30	
Dichlorodifluoromethane (Freon 12)	16.9	0.37	0.50	"	20.0		84	50-150	0.6	30	
1,4-Dichlorobenzene	19.7	0.061	0.30	"	20.0		98	18-190	3	30	
1,3-Dichlorobenzene	20.3	0.081	0.30	"	20.0		101	59-156	2	30	
1,2-Dichlorobenzene	19.7	0.042	0.30	"	20.0		98	18-190	2	30	
Dibromochloromethane	22.0	0.13	0.50	"	20.0		110	53-149	13	30	
Chloromethane	20.5	0.29	0.50	"	20.0		102	10-273	3	30	
Chloroform	21.9	0.13	0.50	"	20.0		110	51-138	4	30	
Chloroethane	21.6	0.20	0.50	"	20.0		108	14-230	9	30	
Chlorobenzene	20.4	0.11	0.30	"	20.0		102	37-160	0.6	30	
Carbon tetrachloride	24.2	0.092	0.50	"	20.0		121	70-140	2	30	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07090 - EPA 5030 Water MS

LCS Dup (CX07090-BSD1)

Prepared & Analyzed: 10/06/14

Bromomethane	22.7	0.20	0.50	µg/L	20.0		113	10-242	2	30	
Bromoform	19.1	0.16	0.50	"	20.0		96	45-169	2	30	
Bromodichloromethane	23.2	0.061	0.50	"	20.0		116	35-155	14	30	
Benzene	23.7	0.057	0.30	"	20.0		118	37-151	14	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>9.91</i>			<i>"</i>	<i>10.0</i>		<i>99</i>	<i>73-125</i>			
<i>Surrogate: Toluene-d8</i>	<i>10.1</i>			<i>"</i>	<i>10.0</i>		<i>101</i>	<i>72-125</i>			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>8.86</i>			<i>"</i>	<i>10.0</i>		<i>89</i>	<i>65-135</i>			

Batch CX07130 - EPA 5030 Water MS

Blank (CX07130-BLK1)

Prepared & Analyzed: 10/07/14

Xylenes (total)	ND	0.35	0.50	µg/L							
Vinyl chloride	ND	0.17	0.50	"							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.15	0.50	"							
Trichlorofluoromethane	ND	0.20	0.50	"							
Trichloroethene	ND	0.11	0.50	"							
1,1,2-Trichloroethane	ND	0.098	0.50	"							
1,1,1-Trichloroethane	ND	0.18	0.50	"							
Toluene	ND	0.10	0.30	"							
Tetrachloroethene	ND	0.12	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.13	0.50	"							
Methylene chloride	ND	0.24	0.50	"							
Ethylbenzene	ND	0.090	0.30	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
cis-1,3-Dichloropropene	ND	0.097	0.50	"							
1,2-Dichloropropane	ND	0.057	0.50	"							
trans-1,2-Dichloroethene	ND	0.13	0.50	"							
cis-1,2-Dichloroethene	ND	0.15	0.50	"							
1,1-Dichloroethene	ND	0.092	0.50	"							
1,2-Dichloroethane	ND	0.054	0.50	"							
1,1-Dichloroethane	ND	0.12	0.50	"							
Dichlorodifluoromethane (Freon 12)	ND	0.37	0.50	"							
1,4-Dichlorobenzene	ND	0.061	0.30	"							
1,3-Dichlorobenzene	ND	0.081	0.30	"							

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07130 - EPA 5030 Water MS

Blank (CX07130-BLK1)

Prepared & Analyzed: 10/07/14

1,2-Dichlorobenzene	ND	0.042	0.30	µg/L
Dibromochloromethane	ND	0.13	0.50	"
Chloromethane	ND	0.29	0.50	"
Chloroform	ND	0.13	0.50	"
2-Chloroethylvinyl ether	ND	0.11	2.0	"
Chloroethane	ND	0.20	0.50	"
Chlorobenzene	ND	0.11	0.30	"
Carbon tetrachloride	ND	0.092	0.50	"
Bromomethane	ND	0.20	0.50	"
Bromoform	ND	0.16	0.50	"
Bromodichloromethane	ND	0.061	0.50	"
Benzene	ND	0.057	0.30	"

Surrogate: 4-Bromofluorobenzene	9.56	"	10.0	96	73-125
Surrogate: Toluene-d8	9.16	"	10.0	92	72-125
Surrogate: 1,2-Dichloroethane-d4	10.5	"	10.0	105	65-135

LCS (CX07130-BS1)

Prepared & Analyzed: 10/07/14

Vinyl chloride	21.2	0.17	0.50	µg/L	20.0	106	10-251
Trichlorofluoromethane	19.9	0.20	0.50	"	20.0	100	47-181
Trichloroethene	19.3	0.11	0.50	"	20.0	96	71-157
1,1,2-Trichloroethane	21.4	0.098	0.50	"	20.0	107	52-150
1,1,1-Trichloroethane	21.4	0.18	0.50	"	20.0	107	52-162
Toluene	20.0	0.10	0.30	"	20.0	100	47-150
Tetrachloroethene	16.2	0.12	0.50	"	20.0	81	64-148
1,1,2,2-Tetrachloroethane	20.8	0.13	0.50	"	20.0	104	46-148
Methylene chloride	22.8	0.24	0.50	"	20.0	114	5-221
Ethylbenzene	17.7	0.090	0.30	"	20.0	89	37-162
trans-1,3-Dichloropropene	18.0	0.12	0.50	"	20.0	90	17-183
cis-1,3-Dichloropropene	19.5	0.097	0.50	"	20.0	98	5-227
1,2-Dichloropropane	22.5	0.057	0.50	"	20.0	112	5-210
trans-1,2-Dichloroethene	23.9	0.13	0.50	"	20.0	120	54-156
1,1-Dichloroethene	21.8	0.092	0.50	"	20.0	109	5-234
1,2-Dichloroethane	24.7	0.054	0.50	"	20.0	123	49-155
1,1-Dichloroethane	25.4	0.12	0.50	"	20.0	127	59-155

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07130 - EPA 5030 Water MS

LCS (CX07130-BS1)

Prepared & Analyzed: 10/07/14

Dichlorodifluoromethane (Freon 12)	19.7	0.37	0.50	µg/L	20.0		99	50-150			
1,4-Dichlorobenzene	16.2	0.061	0.30	"	20.0		81	18-190			
1,3-Dichlorobenzene	16.2	0.081	0.30	"	20.0		81	59-156			
1,2-Dichlorobenzene	17.2	0.042	0.30	"	20.0		86	18-190			
Dibromochloromethane	18.2	0.13	0.50	"	20.0		91	53-149			
Chloromethane	20.5	0.29	0.50	"	20.0		102	10-273			
Chloroform	22.0	0.13	0.50	"	20.0		110	51-138			
Chloroethane	18.8	0.20	0.50	"	20.0		94	14-230			
Chlorobenzene	16.5	0.11	0.30	"	20.0		83	37-160			
Carbon tetrachloride	17.1	0.092	0.50	"	20.0		85	70-140			
Bromomethane	21.7	0.20	0.50	"	20.0		108	10-242			
Bromoform	14.6	0.16	0.50	"	20.0		73	45-169			
Bromodichloromethane	19.0	0.061	0.50	"	20.0		95	35-155			
Benzene	20.9	0.057	0.30	"	20.0		104	37-151			

Surrogate: 4-Bromofluorobenzene	9.61			"	10.0		96	73-125			
Surrogate: Toluene-d8	9.54			"	10.0		95	72-125			
Surrogate: 1,2-Dichloroethane-d4	10.9			"	10.0		109	65-135			

LCS Dup (CX07130-BS1)

Prepared & Analyzed: 10/07/14

Vinyl chloride	22.4	0.17	0.50	µg/L	20.0		112	10-251	6	30	
Trichlorofluoromethane	23.0	0.20	0.50	"	20.0		115	47-181	14	30	
Trichloroethene	19.0	0.11	0.50	"	20.0		95	71-157	2	30	
1,1,2-Trichloroethane	21.3	0.098	0.50	"	20.0		107	52-150	0.6	30	
1,1,1-Trichloroethane	22.5	0.18	0.50	"	20.0		112	52-162	5	30	
Toluene	19.9	0.10	0.30	"	20.0		99	47-150	0.7	30	
Tetrachloroethene	16.4	0.12	0.50	"	20.0		82	64-148	1	30	
1,1,2,2-Tetrachloroethane	19.8	0.13	0.50	"	20.0		99	46-148	5	30	
Methylene chloride	24.1	0.24	0.50	"	20.0		121	5-221	6	30	
Ethylbenzene	18.0	0.090	0.30	"	20.0		90	37-162	1	30	
trans-1,3-Dichloropropene	17.9	0.12	0.50	"	20.0		89	17-183	0.8	30	
cis-1,3-Dichloropropene	19.1	0.097	0.50	"	20.0		95	5-227	2	30	
1,2-Dichloropropane	22.1	0.057	0.50	"	20.0		111	5-210	2	30	
trans-1,2-Dichloroethene	25.2	0.13	0.50	"	20.0		126	54-156	5	30	
1,1-Dichloroethene	22.1	0.092	0.50	"	20.0		110	5-234	2	30	

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07130 - EPA 5030 Water MS

LCS Dup (CX07130-BSD1)

Prepared & Analyzed: 10/07/14

1,2-Dichloroethane	26.4	0.054	0.50	µg/L	20.0		132	49-155	7	30	
1,1-Dichloroethane	25.6	0.12	0.50	"	20.0		128	59-155	0.8	30	
Dichlorodifluoromethane (Freon 12)	13.4	0.37	0.50	"	20.0		67	50-150	38	30	QR-2
1,4-Dichlorobenzene	15.7	0.061	0.30	"	20.0		78	18-190	3	30	
1,3-Dichlorobenzene	15.6	0.081	0.30	"	20.0		78	59-156	3	30	
1,2-Dichlorobenzene	16.6	0.042	0.30	"	20.0		83	18-190	4	30	
Dibromochloromethane	18.4	0.13	0.50	"	20.0		92	53-149	1	30	
Chloromethane	22.4	0.29	0.50	"	20.0		112	10-273	9	30	
Chloroform	22.7	0.13	0.50	"	20.0		113	51-138	3	30	
Chloroethane	21.3	0.20	0.50	"	20.0		106	14-230	12	30	
Chlorobenzene	16.1	0.11	0.30	"	20.0		81	37-160	2	30	
Carbon tetrachloride	17.8	0.092	0.50	"	20.0		89	70-140	4	30	
Bromomethane	22.0	0.20	0.50	"	20.0		110	10-242	1	30	
Bromoform	14.4	0.16	0.50	"	20.0		72	45-169	1	30	
Bromodichloromethane	18.7	0.061	0.50	"	20.0		93	35-155	1	30	
Benzene	20.4	0.057	0.30	"	20.0		102	37-151	2	30	
Surrogate: 4-Bromofluorobenzene	9.27			"	10.0		93	73-125			
Surrogate: Toluene-d8	9.61			"	10.0		96	72-125			
Surrogate: 1,2-Dichloroethane-d4	11.2			"	10.0		112	65-135			

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CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

TPH-Gasoline by GC FID - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07026 - EPA 5030 Water GC

Blank (CX07026-BLK1)

Prepared: 10/03/14 Analyzed: 10/06/14

Gasoline	29.2	10	50	µg/L							J
Surrogate: o-Chlorotoluene (Gas)	19.2			"	20.0		96	65-135			

LCS (CX07026-BS1)

Prepared: 10/03/14 Analyzed: 10/06/14

Gasoline	383	10	50	µg/L	500		77	70-130			
Surrogate: o-Chlorotoluene (Gas)	19.6			"	20.0		98	65-135			

LCS Dup (CX07026-BSD1)

Prepared: 10/03/14 Analyzed: 10/06/14

Gasoline	389	10	50	µg/L	500		78	70-130	1	30	
Surrogate: o-Chlorotoluene (Gas)	19.8			"	20.0		99	65-135			

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10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

Notes and Definitions

TPH-X	Although the sample contains compounds in the retention time range of target parameter, the chromatogram was not consistent with the expected chromatographic pattern or "fingerprint". However, the reported concentration is based on the target parameter.
QR-2	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY

CLS ID. NO. CXJ0062-1 (1 of 3)

Report To:				Client Job Number 3602-212			ANALYSIS REQUESTED				GEOTRACKER			
Name and Address Earth Resources Technology, Inc.				Destination Laboratory			PRESERVATIVES VOCs (EPA 824) TPH-GBTEX TPH-D, -JP/5/8, -MO Total Dissolved Solids				EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO			
NASA Ames Research Center				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Ramcho Cordova, CA 95742 www.californialab.com							GLOBAL ID.			
Moffett Field, CA				<input type="checkbox"/> OTHER							FIELD CONDITIONS:			
Project Manager Brian Reddig (650) 604-1315											COMPOSITE:			
Project Name 2014 Annual NASA RGRP Groundwater Sampling											TURNAROUND TIME IN DAYS			
Sampled By Brian Reddig											SPECIAL INSTRUCTIONS			
Job Description Q3 2014 NASA RGRP Sampling														
Site Location NASA RGRP														
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE	1	2	5	10				
9/29/14	7:40	11K17A ✓		Groundwater	3	VOA	1	X						
9/29/14	8:11	11E02A ✓		Groundwater	3	VOA	1	X						
9/29/14	8:33	11M25A ✓		Groundwater	3	VOA	1	X						
9/29/14	8:56	11M03A ✓		Groundwater	4	Mixed	1,3	X		X				
9/29/14	9:20	11M17A ✓		Groundwater	3	VOA	1	X						
9/29/14	9:54	11M21A ✓		Groundwater	3	VOA	1	X						
9/29/14	10:19	WSI-04A1 ✓		Groundwater	3	VOA	1	X						
9/29/14	10:25	NASA-3A ✓		Groundwater	3	VOA	1	X						
9/29/14	12:25	14D37A ✓		Groundwater	5	Mixed	1,3	X	X	X				
9/29/14	12:53	11N22A1 ✓		Groundwater	3	VOA	1	X						
9/29/14	1:13	11N22K1 ✓		Groundwater	3	VOA	1	X						
9/29/14	2:30	FB092914 ✓		Water	3	VOA	1	X						
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME				PRESERVATIVES (1) HCL (3) = COLD (2) HNO ₃ (4)			
RELINQUISHED BY (Signature)				PRINT NAME/COMPANY			DATE/TIME				RECEIVED BY (Signature)			
<i>Brian Reddig</i>				Brian Reddig/ERT			10/14/14 17:04				<i>[Signature]</i>			
RECEIVED AT LAB BY:				DATE/TIME:			CONDITIONS/COMMENTS:							
SHIPPED BY:				DATE/TIME:			AIRBILL #							
<input checked="" type="checkbox"/> FED EX <input type="checkbox"/> UPS <input type="checkbox"/> OTHER				10/14/14 17:05			7.7							

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffett Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY

CLS ID. NO. CXJ0062-2 (2 of 3)

Report To:				Client Job Number 3602-212			ANALYSIS REQUESTED								GEOTRACKER			
Name and Address Earth Resources Technology, Inc.				Destination Laboratory			<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 5px;">PRESERVATIVES</div> <div> <div>VOCs (EPA 624)</div> <div>TPH-G/BTEX</div> <div>TPH-D -JP/5/8, -MO</div> <div>Total Dissolved Solids</div> </div> </div>								EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO			
NASA Ames Research Center															GLOBAL ID.			
Moffett Field, CA				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com <input type="checkbox"/> OTHER			<div>FIELD CONDITIONS:</div> <div>COMPOSITE:</div> <div> <div>TURNAROUND TIME IN DAYS</div> <div>SPECIAL INSTRUCTIONS</div> </div>											
Project Manager Brian Reddig (650) 604-1315																		
Project Name 2014 Annual NASA RGRP Groundwater Sampling																		
Sampled By Brian Reddig																		
Job Description Q3 2014 NASA RGRP Sampling																		
Site Location NASA RGRP																		
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE	1	2	5	10								
9/29/14	2:33	11M16A1 ✓		Groundwater	3	VOA	1	X										
9/29/14	3:04	W08-08A1 ✓		Groundwater	4	Mixed	1,3	X		X								
9/29/14	3:20	NASA-1A ✓		Groundwater	5	Mixed	1,3	X	X	X								
9/29/14	5:27	14E14A ✓		Groundwater	3	VOA	1	X										
9/29/14	6:00	15H05A ✓		Groundwater	3	VOA	1	X										
9/29/14	6:16	14D09A ✓		Groundwater	3	VOA	1	X										
9/30/14	9:15	WNB-08A1 ✓		Groundwater	3	VOA	1	X										
9/30/14	9:32	11M24A ✓		Groundwater	3	VOA	1	X										
9/30/14	9:58	14D28A ✓		Groundwater	5	Mixed	1,3	X	X	X								
9/30/14	10:22	14C60A ✓		Groundwater	5	Mixed	1,3	X	X	X								
9/30/14	10:41	14D33A ✓		Groundwater	5	Mixed	1,3	X	X	X								
9/30/14	11:05	14D02A ✓		Groundwater	5	Mixed	1,3	X	X	X								
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME				PRESERVATIVES: (1) HCL (2) HNO ₃ (3) = COLD (4)							
RELINQUISHED BY (Signature) <i>Brian Reddig</i>				PRINT NAME/COMPANY Brian Reddig/ERT			DATE/TIME 10/14/2014			RECEIVED BY (Signature) <i>[Signature]</i>			PRINT NAME/COMPANY CER					
RECEIVED AT LAB BY: <i>[Signature]</i>				DATE/TIME: 10/14/2014			CONDITIONS/COMMENTS: 24											
SHIPPED BY:				<input checked="" type="checkbox"/> FED EX <input type="checkbox"/> UPS <input type="checkbox"/> OTHER			AIR BILL #											

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY

CLS ID. NO. CXJ0062-3 (3 of 3)

Report To:				Client Job Number 3602-212			ANALYSIS REQUESTED				GEOTRACKER						
Name and Address Earth Resources Technology, Inc.							PRESERVATIVES VOCs (EPA 624) TPH-G/BTEX TPH-D, -P/I5/8, -MO				EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO						
NASA Ames Research Center				Destination Laboratory							GLOBAL ID						
Moffett Field, CA				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com							FIELD CONDITIONS: COMPOSITE:						
Project Manager Brian Reddig (650) 604-1315																	
Project Name 2014 Annual NASA RGRP Groundwater Sampling																	
Sampled By Brian Reddig							TURNAROUND TIME IN DAYS				SPECIAL INSTRUCTIONS						
Job Description Q3 2014 NASA RGRP Sampling																	
Site Location NASA RGRP																	
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE	1	2	5	10							
9/30/14	1:44	14D25A2 ✓		Groundwater	3	VOA	1	X				X					
9/30/14	2:24	14D31A2 ✓		Groundwater	3	VOA	1	X				X					
9/30/14	2:26	FB093014 ✓		Water	3	VOA	1	X				X					
9/30/14	5:05	14D13A ✓		Groundwater	3	VOA	1	X				X					
9/30/14	5:27	11N26A ✓		Groundwater	5	VOA	1,3	X	X	X		X					
9/30/14	5:54	11N21A1 ✓		Groundwater	3	VOA	1	X				X					
9/30/14	6:15	TB093014 ✓		Water	3	VOA	1	X				X					
													INVOICE TO:				
													FO:				
													QUOTE:				
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME			PRESERVATIVES (1) HCL (3) - COLD (2) HNO (4)							
RELINQUISHED BY (Signature)				PRINT NAME/COMPANY			DATE/TIME			RECEIVED BY (Signature)			PRINT NAME/COMPANY				
<i>Brian Reddig</i>				Brian Reddig/ERT			9/30/14 12:45			<i>[Signature]</i>			as				
RECEIVED AT LAB BY:				DATE/TIME:			CONDITIONS/COMMENTS:										
SHIPPED BY:				<input type="checkbox"/> FED EX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER <i>CL</i>			AIR BILL #										

CALIFORNIA LABORATORY SERVICES

10/08/14 14:59

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: 2014 Annual NASA RGRP Groundwater Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0062
COC #:

CLS LABS SAMPLE RECEIVING EXCEPTION REPORTS

CLS Labs Job # CXJ0062

Problem discovered by: [Signature]

Date: 10/1/14

Nature of problem

* Sample # 11 ID's do not match from
COC to Label on bottle

Client contacted? Yes ☐ No ☐ Spoke With: _____

By whom: _____ Date: ____/____/____ Time: _____ HRS

Client instructions:

* Logged in Per COC

Resolution of problem:

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

08 October 2014

CLS Work Order #: CXJ0074

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

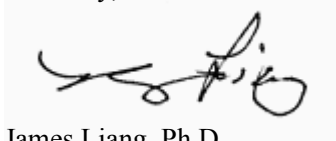
Moffet Field, CA 94053-1000

Project Name: AOI 4 Quarterly O&M

Enclosed are the results of analyses for samples received by the laboratory on 10/01/14 17:05. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed below as well as under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is shown within a light gray rectangular box.

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXJ0074-01) Water Sampled: 09/29/14 11:30 Received: 10/01/14 17:05										
<i>Surrogate: o-Terphenyl</i>	<i>130 %</i>		<i>65-135</i>	mg/L		<i>CX07003</i>	10/02/14	10/07/14	<i>EPA 8015M</i>	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	0.32	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	
TANK1-E (CXJ0074-02) Water Sampled: 09/29/14 11:34 Received: 10/01/14 17:05										
<i>Surrogate: o-Terphenyl</i>	<i>92 %</i>		<i>65-135</i>	mg/L		<i>CX07003</i>	10/02/14	10/07/14	<i>EPA 8015M</i>	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	ND	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	
15A11A (CXJ0074-03) Water Sampled: 09/29/14 12:08 Received: 10/01/14 17:05										
<i>Surrogate: o-Terphenyl</i>	<i>113 %</i>		<i>65-135</i>	mg/L		<i>CX07003</i>	10/02/14	10/07/14	<i>EPA 8015M</i>	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	0.30	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	

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916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXJ0074-01) Water Sampled: 09/29/14 11:30 Received: 10/01/14 17:05										
Surrogate: o-Chlorotoluene (Gas)	108 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	140	10	50	"	1	"	"	"	"	
TANK1-E (CXJ0074-02) Water Sampled: 09/29/14 11:34 Received: 10/01/14 17:05										
Surrogate: o-Chlorotoluene (Gas)	98 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	29	10	50	"	1	"	"	"	"	J
15A11A (CXJ0074-03) Water Sampled: 09/29/14 12:08 Received: 10/01/14 17:05										
Surrogate: o-Chlorotoluene (Gas)	126 %		65-135	µg/L		CX07026	10/03/14	10/06/14	EPA 8015M	
Gasoline	130	10	50	"	1	"	"	"	"	

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10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXJ0074-01) Water Sampled: 09/29/14 11:30 Received: 10/01/14 17:05										
<i>Surrogate: Toluene-d8</i>	<i>104 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX07040</i>	<i>10/03/14</i>	<i>10/03/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.061	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.045	0.50	"	1	"	"	"	"	
Toluene	ND	0.073	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.23	1.0	"	1	"	"	"	"	
TANK1-E (CXJ0074-02) Water Sampled: 09/29/14 11:34 Received: 10/01/14 17:05										
<i>Surrogate: Toluene-d8</i>	<i>96 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX07040</i>	<i>10/03/14</i>	<i>10/03/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.061	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.045	0.50	"	1	"	"	"	"	
Toluene	ND	0.073	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.23	1.0	"	1	"	"	"	"	
15A11A (CXJ0074-03) Water Sampled: 09/29/14 12:08 Received: 10/01/14 17:05										
<i>Surrogate: Toluene-d8</i>	<i>103 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX07040</i>	<i>10/03/14</i>	<i>10/03/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.061	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.045	0.50	"	1	"	"	"	"	
Toluene	ND	0.073	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.23	1.0	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX07003 - EPA 3510B GCNV

Blank (CX07003-BLK1)

Prepared: 10/02/14 Analyzed: 10/07/14

Surrogate: o-Terphenyl	0.0229			mg/L	0.0250		92	65-135			
Diesel	ND	0.0021	0.050	"							
Motor Oil	ND	0.0091	0.050	"							
JP-5/JP-8	ND	0.020	0.050	"							

LCS (CX07003-BS1)

Prepared: 10/02/14 Analyzed: 10/07/14

Surrogate: o-Terphenyl	0.0272			mg/L	0.0250		109	65-135			
Diesel	2.11	0.0021	0.050	"	2.50		84	65-135			

LCS Dup (CX07003-BSD1)

Prepared: 10/02/14 Analyzed: 10/07/14

Surrogate: o-Terphenyl	0.0233			mg/L	0.0250		93	65-135			
Diesel	2.22	0.0021	0.050	"	2.50		89	65-135	5	30	

Matrix Spike (CX07003-MS1)

Source: CX11384-01

Prepared: 10/02/14 Analyzed: 10/07/14

Surrogate: o-Terphenyl	0.0251			mg/L	0.0250		100	65-135			
Diesel	2.41	0.0021	0.050	"	2.50	ND	96	46-137			

Matrix Spike Dup (CX07003-MSD1)

Source: CX11384-01

Prepared: 10/02/14 Analyzed: 10/07/14

Surrogate: o-Terphenyl	0.0247			mg/L	0.0250		99	65-135			
Diesel	2.17	0.0021	0.050	"	2.50	ND	87	46-137	10	30	

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CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

TPH-Gasoline by GC FID - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	----------------	-----	--------------	-------

Batch CX07026 - EPA 5030 Water GC

Blank (CX07026-BLK1)

Prepared: 10/03/14 Analyzed: 10/06/14

Surrogate: o-Chlorotoluene (Gas)	19.2			µg/L	20.0		96	65-135		
Gasoline	29.2	10	50	"						J

LCS (CX07026-BS1)

Prepared: 10/03/14 Analyzed: 10/06/14

Surrogate: o-Chlorotoluene (Gas)	19.6			µg/L	20.0		98	65-135		
Gasoline	383	10	50	"	500		77	70-130		

LCS Dup (CX07026-BSD1)

Prepared: 10/03/14 Analyzed: 10/06/14

Surrogate: o-Chlorotoluene (Gas)	19.8			µg/L	20.0		99	65-135		
Gasoline	389	10	50	"	500		78	70-130	1	30

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CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

Volatile Organic Compounds by EPA Method 8260B - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX07040 - EPA 5030 Water MS

Blank (CX07040-BLK1)

Prepared & Analyzed: 10/03/14

Surrogate: Toluene-d8	10.2			µg/L	10.0		102	72-125			
Benzene	ND	0.061	0.50	"							
Toluene	ND	0.073	0.50	"							
Ethylbenzene	ND	0.045	0.50	"							
Xylenes (total)	ND	0.23	1.0	"							

LCS (CX07040-BS1)

Prepared & Analyzed: 10/03/14

Surrogate: Toluene-d8	9.21			µg/L	10.0		92	72-125			
Benzene	21.8	0.061	0.50	"	20.0		109	60-135			
Toluene	21.4	0.073	0.50	"	20.0		107	60-137			

LCS Dup (CX07040-BSD1)

Prepared & Analyzed: 10/03/14

Surrogate: Toluene-d8	9.59			µg/L	10.0		96	72-125			
Benzene	21.2	0.061	0.50	"	20.0		106	60-135	3	25	
Toluene	21.2	0.073	0.50	"	20.0		106	60-137	1	25	

Matrix Spike (CX07040-MS1)

Source: CXJ0136-03

Prepared & Analyzed: 10/03/14

Surrogate: Toluene-d8	10.3			µg/L	10.0		103	72-125			
Benzene	25.1	0.061	0.50	"	20.0	ND	125	0-200			
Toluene	23.8	0.073	0.50	"	20.0	ND	119	0-200			

Matrix Spike Dup (CX07040-MSD1)

Source: CXJ0136-03

Prepared & Analyzed: 10/03/14

Surrogate: Toluene-d8	9.96			µg/L	10.0		100	72-125			
Benzene	24.0	0.061	0.50	"	20.0	ND	120	0-200	4	200	
Toluene	23.3	0.073	0.50	"	20.0	ND	117	0-200	2	200	

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CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

Notes and Definitions

J Detected but below the Reporting Limit; therefore, result is an estimated concentration.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

10/08/14 15:34

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXJ0074
COC #:

[illegible]

CA DOHS ELAP Accreditation/Registration Number 1233

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916-638-7301

Fax: 916-638-4510



Quarter 4, 2014

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

30 December 2014

CLS Work Order #: CXL1158

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

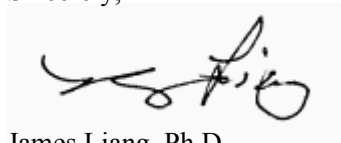
Moffet Field, CA 94053-1000

Project Name: Q4 2014 NASA RGRP Extraction Well Samplin

Enclosed are the results of analyses for samples received by the laboratory on 12/22/14 17:20. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed below as well as under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is written over a light gray rectangular background.

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXL1158-01) Water Sampled: 12/22/14 11:36 Received: 12/22/14 17:20										
<i>Surrogate: o-Terphenyl</i>	<i>103 %</i>		<i>65-135</i>	mg/L		<i>CX09174</i>	12/24/14	12/26/14	<i>EPA 8015M</i>	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	ND	0.020	0.050	"	1	"	"	"	"	
Motor Oil	0.012	0.0091	0.050	"	1	"	"	"	"	J

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXL1158-01) Water Sampled: 12/22/14 11:36 Received: 12/22/14 17:20										
Surrogate: 1,2-Dichloroethane-d4	112 %		65-135	µg/L		CX09163	12/24/14	12/24/14	EPA 624	
Surrogate: 4-Bromofluorobenzene	100 %		73-125	"		"	"	"	"	
Surrogate: Toluene-d8	118 %		72-125	"		"	"	"	"	
1,1,1-Trichloroethane	ND	0.18	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.13	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.55	0.15	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	ND	0.098	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	2.4	0.12	0.50	"	1	"	"	"	"	
1,1-Dichloroethene	1.8	0.092	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	ND	0.042	0.30	"	1	"	"	"	"	
1,2-Dichloroethane	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichloropropane	ND	0.057	0.50	"	1	"	"	"	"	
1,3-Dichlorobenzene	ND	0.081	0.30	"	1	"	"	"	"	
1,4-Dichlorobenzene	ND	0.061	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.11	2.0	"	1	"	"	"	"	
Benzene	ND	0.057	0.30	"	1	"	"	"	"	
Bromodichloromethane	ND	0.061	0.50	"	1	"	"	"	"	
Bromoform	ND	0.16	0.50	"	1	"	"	"	"	
Bromomethane	ND	0.20	0.50	"	1	"	"	"	"	
Carbon tetrachloride	ND	0.092	0.50	"	1	"	"	"	"	
Chlorobenzene	ND	0.11	0.30	"	1	"	"	"	"	
Chloroethane	ND	0.20	0.50	"	1	"	"	"	"	
Chloroform	ND	0.13	0.50	"	1	"	"	"	"	
Chloromethane	ND	0.29	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	32	0.15	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.097	0.50	"	1	"	"	"	"	
Dibromochloromethane	ND	0.13	0.50	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.37	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.090	0.30	"	1	"	"	"	"	
Methylene chloride	ND	0.24	0.50	"	1	"	"	"	"	
Tetrachloroethene	ND	0.12	0.50	"	1	"	"	"	"	
Toluene	ND	0.10	0.30	"	1	"	"	"	"	
trans-1,2-Dichloroethene	0.87	0.13	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames	Project: Q4 2014 NASA RGRP Extraction Well Sampling	CLS Work Order #: CXL1158
Bldg T20G-4, Room 135	Project Number: 3602-212	
Moffet Field CA, 94053-1000	Project Manager: Brian Reddig	

Purgeables by EPA Method 624

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXL1158-01) Water Sampled: 12/22/14 11:36 Received: 12/22/14 17:20										
Trichloroethene	31	0.11	0.50	µg/L	1	CX09163	"	12/24/14	EPA 624	
Trichlorofluoromethane	ND	0.20	0.50	"	1	"	"	"	"	
Vinyl chloride	1.0	0.17	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.35	0.50	"	1	"	"	"	"	
NASA-3A (CXL1158-02) Water Sampled: 12/22/14 11:57 Received: 12/22/14 17:20										
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>109 %</i>		<i>65-135</i>	µg/L		<i>CX09163</i>	12/24/14	<i>12/24/14</i>	<i>EPA 624</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>101 %</i>		<i>73-125</i>	"		"	"	"	"	
<i>Surrogate: Toluene-d8</i>	<i>113 %</i>		<i>72-125</i>	"		"	"	"	"	
1,1,1-Trichloroethane	0.83	0.18	0.50	"	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.13	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	1.1	0.15	0.50	"	1	"	"	"	"	
1,1,2-Trichloroethane	ND	0.098	0.50	"	1	"	"	"	"	
1,1-Dichloroethane	3.8	0.12	0.50	"	1	"	"	"	"	
1,1-Dichloroethene	11	0.092	0.50	"	1	"	"	"	"	
1,2-Dichlorobenzene	ND	0.042	0.30	"	1	"	"	"	"	
1,2-Dichloroethane	ND	0.054	0.50	"	1	"	"	"	"	
1,2-Dichloropropane	ND	0.057	0.50	"	1	"	"	"	"	
1,3-Dichlorobenzene	ND	0.081	0.30	"	1	"	"	"	"	
1,4-Dichlorobenzene	ND	0.061	0.30	"	1	"	"	"	"	
2-Chloroethylvinyl ether	ND	0.11	2.0	"	1	"	"	"	"	
Benzene	ND	0.057	0.30	"	1	"	"	"	"	
Bromodichloromethane	ND	0.061	0.50	"	1	"	"	"	"	
Bromoform	ND	0.16	0.50	"	1	"	"	"	"	
Bromomethane	ND	0.20	0.50	"	1	"	"	"	"	
Carbon tetrachloride	ND	0.092	0.50	"	1	"	"	"	"	
Chlorobenzene	ND	0.11	0.30	"	1	"	"	"	"	
Chloroethane	ND	0.20	0.50	"	1	"	"	"	"	
Chloroform	0.36	0.13	0.50	"	1	"	"	"	"	J
Chloromethane	ND	0.29	0.50	"	1	"	"	"	"	
cis-1,2-Dichloroethene	1.2	0.15	0.50	"	1	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.097	0.50	"	1	"	"	"	"	
Dibromochloromethane	ND	0.13	0.50	"	1	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.37	0.50	"	1	"	"	"	"	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-3A (CXL1158-02) Water Sampled: 12/22/14 11:57 Received: 12/22/14 17:20										
Ethylbenzene	ND	0.090	0.30	µg/L	1	CX09163	"	12/24/14	EPA 624	
Methylene chloride	ND	0.24	0.50	"	1	"	"	"	"	
Tetrachloroethene	ND	0.12	0.50	"	1	"	"	"	"	
Toluene	ND	0.10	0.30	"	1	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.13	0.50	"	1	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.12	0.50	"	1	"	"	"	"	
Trichloroethene	9.6	0.11	0.50	"	1	"	"	"	"	
Trichlorofluoromethane	1.5	0.20	0.50	"	1	"	"	"	"	
Vinyl chloride	ND	0.17	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.35	0.50	"	1	"	"	"	"	

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NASA-1A (CXL1158-01) Water Sampled: 12/22/14 11:36 Received: 12/22/14 17:20										
<i>Surrogate: o-Chlorotoluene (Gas)</i>	<i>93 %</i>		<i>65-135</i>	<i>µg/L</i>		<i>CX09177</i>	<i>12/24/14</i>	<i>12/26/14</i>	<i>EPA 8015M</i>	
Gasoline	25	10	50	"	1	"	"	"	"	J

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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NASA-1A (CXL1158-01) Water **Sampled: 12/22/14 11:36** **Received: 12/22/14 17:20**

<i>Surrogate: Toluene-d8</i>	<i>118 %</i>		<i>72-125</i>	<i>µg/L</i>		<i>CX09163</i>	<i>12/24/14</i>	<i>12/24/14</i>	<i>EPA 8260B</i>	
Benzene	ND	0.11	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.10	0.50	"	1	"	"	"	"	
Toluene	ND	0.11	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.33	1.0	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09174 - EPA 3510B GCNV

Blank (CX09174-BLK1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0251			mg/L	0.0250		101	65-135			
Diesel	ND	0.0021	0.050	"							
Motor Oil	ND	0.0091	0.050	"							
Hydraulic Oil	ND	0.030	0.050	"							
Mineral Oil	ND	0.020	0.050	"							
Kerosene	ND	0.0036	0.050	"							

LCS (CX09174-BS1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0246			mg/L	0.0250		98	65-135			
Diesel	3.03	0.0021	0.050	"	2.50		121	65-135			

LCS Dup (CX09174-BSD1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0211			mg/L	0.0250		84	65-135			
Diesel	2.88	0.0021	0.050	"	2.50		115	65-135	5	30	

Matrix Spike (CX09174-MS1)

Source: CXL1154-01

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0225			mg/L	0.0250		90	65-135			
Diesel	3.00	0.0021	0.050	"	2.50	ND	120	46-137			

Matrix Spike Dup (CX09174-MSD1)

Source: CXL1154-01

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0242			mg/L	0.0250		97	65-135			
Diesel	2.91	0.0021	0.050	"	2.50	ND	116	46-137	3	30	

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12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field CA, 94053-1000	Project: Q4 2014 NASA RGRP Extraction Well Sampling Project Number: 3602-212 Project Manager: Brian Reddig	CLS Work Order #: CXL1158 COC #:
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Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09163 - EPA 5030 Water MS

Blank (CX09163-BLK1)

Prepared & Analyzed: 12/24/14

Surrogate: 1,2-Dichloroethane-d4	10.5			µg/L	10.0		105	65-135			
Surrogate: Toluene-d8	11.7			"	10.0		117	72-125			
Surrogate: 4-Bromofluorobenzene	10.0			"	10.0		100	73-125			
Benzene	ND	0.057	0.30	"							
Bromodichloromethane	ND	0.061	0.50	"							
Bromoform	ND	0.16	0.50	"							
Bromomethane	ND	0.20	0.50	"							
Carbon tetrachloride	ND	0.092	0.50	"							
Chlorobenzene	ND	0.11	0.30	"							
Chloroethane	ND	0.20	0.50	"							
2-Chloroethylvinyl ether	ND	0.11	2.0	"							
Chloroform	ND	0.13	0.50	"							
Chloromethane	ND	0.29	0.50	"							
Dibromochloromethane	ND	0.13	0.50	"							
1,2-Dichlorobenzene	ND	0.042	0.30	"							
1,3-Dichlorobenzene	ND	0.081	0.30	"							
1,4-Dichlorobenzene	ND	0.061	0.30	"							
Dichlorodifluoromethane (Freon 12)	ND	0.37	0.50	"							
1,1-Dichloroethane	ND	0.12	0.50	"							
1,2-Dichloroethane	ND	0.054	0.50	"							
1,1-Dichloroethene	ND	0.092	0.50	"							
cis-1,2-Dichloroethene	ND	0.15	0.50	"							
trans-1,2-Dichloroethene	ND	0.13	0.50	"							
1,2-Dichloropropane	ND	0.057	0.50	"							
cis-1,3-Dichloropropene	ND	0.097	0.50	"							
trans-1,3-Dichloropropene	ND	0.12	0.50	"							
Ethylbenzene	ND	0.090	0.30	"							
Methylene chloride	ND	0.24	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.13	0.50	"							
Tetrachloroethene	ND	0.12	0.50	"							
Toluene	ND	0.10	0.30	"							
1,1,1-Trichloroethane	ND	0.18	0.50	"							
1,1,2-Trichloroethane	ND	0.098	0.50	"							
Trichloroethene	ND	0.11	0.50	"							
Trichlorofluoromethane	ND	0.20	0.50	"							

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12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09163 - EPA 5030 Water MS

Blank (CX09163-BLK1)

Prepared & Analyzed: 12/24/14

1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.15	0.50	µg/L
Vinyl chloride	ND	0.17	0.50	"
Xylenes (total)	ND	0.35	0.50	"

LCS (CX09163-BS1)

Prepared & Analyzed: 12/24/14

Surrogate: 1,2-Dichloroethane-d4	9.95			µg/L	10.0		100	65-135	
Surrogate: Toluene-d8	9.09			"	10.0		91	72-125	
Surrogate: 4-Bromofluorobenzene	9.86			"	10.0		99	73-125	
Benzene	20.6	0.057	0.30	"	20.0		103	37-151	
Bromodichloromethane	21.1	0.061	0.50	"	20.0		105	35-155	
Bromoform	20.5	0.16	0.50	"	20.0		102	45-169	
Bromomethane	16.8	0.20	0.50	"	20.0		84	10-242	
Carbon tetrachloride	47.2	0.092	0.50	"	20.0		236	70-140	QC-4H
Chlorobenzene	19.0	0.11	0.30	"	20.0		95	37-160	
Chloroethane	13.3	0.20	0.50	"	20.0		67	14-230	
Chloroform	21.0	0.13	0.50	"	20.0		105	51-138	
Chloromethane	10.9	0.29	0.50	"	20.0		54	10-273	
Dibromochloromethane	20.0	0.13	0.50	"	20.0		100	53-149	
1,2-Dichlorobenzene	17.7	0.042	0.30	"	20.0		88	18-190	
1,3-Dichlorobenzene	17.7	0.081	0.30	"	20.0		88	59-156	
1,4-Dichlorobenzene	17.7	0.061	0.30	"	20.0		88	18-190	
Dichlorodifluoromethane (Freon 12)	6.67	0.37	0.50	"	20.0		33	50-150	MS-L
1,1-Dichloroethane	22.3	0.12	0.50	"	20.0		111	59-155	
1,2-Dichloroethane	20.6	0.054	0.50	"	20.0		103	49-155	
1,1-Dichloroethene	16.7	0.092	0.50	"	20.0		84	5-234	
trans-1,2-Dichloroethene	20.4	0.13	0.50	"	20.0		102	54-156	
1,2-Dichloropropane	20.3	0.057	0.50	"	20.0		102	5-210	
cis-1,3-Dichloropropene	20.2	0.097	0.50	"	20.0		101	5-227	
trans-1,3-Dichloropropene	21.3	0.12	0.50	"	20.0		107	17-183	
Ethylbenzene	18.9	0.090	0.30	"	20.0		94	37-162	
Methylene chloride	20.2	0.24	0.50	"	20.0		101	5-221	
1,1,2,2-Tetrachloroethane	13.0	0.13	0.50	"	20.0		65	46-148	
Tetrachloroethene	17.9	0.12	0.50	"	20.0		90	64-148	
Toluene	20.1	0.10	0.30	"	20.0		100	47-150	
1,1,1-Trichloroethane	23.6	0.18	0.50	"	20.0		118	52-162	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09163 - EPA 5030 Water MS

LCS (CX09163-BS1)

Prepared & Analyzed: 12/24/14

1,1,2-Trichloroethane	18.5	0.098	0.50	µg/L	20.0		92	52-150			
Trichloroethene	24.6	0.11	0.50	"	20.0		123	71-157			
Trichlorofluoromethane	15.6	0.20	0.50	"	20.0		78	47-181			
Vinyl chloride	14.9	0.17	0.50	"	20.0		74	10-251			

LCS Dup (CX09163-BS1)

Prepared & Analyzed: 12/24/14

<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>10.7</i>			<i>µg/L</i>	<i>10.0</i>		<i>107</i>	<i>65-135</i>			
<i>Surrogate: Toluene-d8</i>	<i>9.81</i>			<i>"</i>	<i>10.0</i>		<i>98</i>	<i>72-125</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>11.3</i>			<i>"</i>	<i>10.0</i>		<i>113</i>	<i>73-125</i>			
Benzene	20.7	0.057	0.30	"	20.0		103	37-151	0.3	30	
Bromodichloromethane	20.9	0.061	0.50	"	20.0		105	35-155	0.8	30	
Bromoform	19.4	0.16	0.50	"	20.0		97	45-169	5	30	
Bromomethane	14.8	0.20	0.50	"	20.0		74	10-242	13	30	
Carbon tetrachloride	24.9	0.092	0.50	"	20.0		124	70-140	62	30	QC-4H
Chlorobenzene	19.1	0.11	0.30	"	20.0		96	37-160	0.5	30	
Chloroethane	20.9	0.20	0.50	"	20.0		104	14-230	44	30	QR-2
Chloroform	22.9	0.13	0.50	"	20.0		114	51-138	8	30	
Chloromethane	13.8	0.29	0.50	"	20.0		69	10-273	24	30	
Dibromochloromethane	20.8	0.13	0.50	"	20.0		104	53-149	4	30	
1,2-Dichlorobenzene	19.9	0.042	0.30	"	20.0		100	18-190	12	30	
1,3-Dichlorobenzene	19.6	0.081	0.30	"	20.0		98	59-156	10	30	
1,4-Dichlorobenzene	19.6	0.061	0.30	"	20.0		98	18-190	10	30	
Dichlorodifluoromethane (Freon 12)	6.35	0.37	0.50	"	20.0		32	50-150	5	30	MS-L
1,1-Dichloroethane	23.1	0.12	0.50	"	20.0		115	59-155	4	30	
1,2-Dichloroethane	23.1	0.054	0.50	"	20.0		116	49-155	11	30	
1,1-Dichloroethene	20.6	0.092	0.50	"	20.0		103	5-234	21	30	
trans-1,2-Dichloroethene	21.8	0.13	0.50	"	20.0		109	54-156	7	30	
1,2-Dichloropropane	21.0	0.057	0.50	"	20.0		105	5-210	3	30	
cis-1,3-Dichloropropene	19.8	0.097	0.50	"	20.0		99	5-227	2	30	
trans-1,3-Dichloropropene	20.4	0.12	0.50	"	20.0		102	17-183	5	30	
Ethylbenzene	18.8	0.090	0.30	"	20.0		94	37-162	0.4	30	
Methylene chloride	22.1	0.24	0.50	"	20.0		110	5-221	9	30	
1,1,2,2-Tetrachloroethane	17.7	0.13	0.50	"	20.0		89	46-148	31	30	QR-2
Tetrachloroethene	19.3	0.12	0.50	"	20.0		96	64-148	7	30	
Toluene	21.7	0.10	0.30	"	20.0		108	47-150	8	30	
1,1,1-Trichloroethane	21.9	0.18	0.50	"	20.0		110	52-162	7	30	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09163 - EPA 5030 Water MS

LCS Dup (CX09163-BSD1)

Prepared & Analyzed: 12/24/14

1,1,2-Trichloroethane	21.2	0.098	0.50	µg/L	20.0		106	52-150	14	30	
Trichloroethene	23.3	0.11	0.50	"	20.0		117	71-157	5	30	
Trichlorofluoromethane	20.7	0.20	0.50	"	20.0		104	47-181	28	30	
Vinyl chloride	15.6	0.17	0.50	"	20.0		78	10-251	4	30	

Matrix Spike (CX09163-MS1)

Source: CXL1250-01

Prepared & Analyzed: 12/24/14

Surrogate: 1,2-Dichloroethane-d4	9.87			µg/L	10.0		99	65-135			
Surrogate: Toluene-d8	9.34			"	10.0		93	72-125			
Surrogate: 4-Bromofluorobenzene	10.7			"	10.0		107	73-125			
Benzene	1020	2.9	15	"	1000	ND	102	37-151			
Bromodichloromethane	1040	3.1	25	"	1000	ND	104	35-155			
Bromoform	978	8.1	25	"	1000	ND	98	45-169			
Bromomethane	738	10	25	"	1000	ND	74	10-242			
Carbon tetrachloride	2330	4.6	25	"	1000	ND	233	70-140			QM-7
Chlorobenzene	950	5.6	15	"	1000	ND	95	37-163			
Chloroethane	508	10	25	"	1000	ND	51	14-230			
Chloroform	1030	6.4	25	"	1000	ND	103	51-138			
Chloromethane	468	14	25	"	1000	ND	47	10-273			
Dibromochloromethane	992	6.7	25	"	1000	ND	99	53-149			
1,2-Dichlorobenzene	951	2.1	15	"	1000	ND	95	18-190			
1,3-Dichlorobenzene	957	4.1	15	"	1000	ND	96	59-156			
1,4-Dichlorobenzene	955	3.1	15	"	1000	ND	96	18-190			
Dichlorodifluoromethane (Freon 12)	325	18	25	"	1000	ND	32	50-150			QM-7
1,1-Dichloroethane	1060	5.9	25	"	1000	ND	106	59-155			
1,2-Dichloroethane	1050	2.7	25	"	1000	ND	105	49-155			
1,1-Dichloroethene	780	4.6	25	"	1000	ND	78	5-234			
trans-1,2-Dichloroethene	983	6.4	25	"	1000	ND	98	54-156			
1,2-Dichloropropane	994	2.9	25	"	1000	ND	99	5-210			
cis-1,3-Dichloropropene	1030	4.9	25	"	1000	ND	103	5-227			
trans-1,3-Dichloropropene	1090	6.0	25	"	1000	ND	109	17-183			
Ethylbenzene	941	4.5	15	"	1000	ND	94	37-162			
Methylene chloride	963	12	25	"	1000	ND	96	5-221			
1,1,2,2-Tetrachloroethane	943	6.4	25	"	1000	ND	94	46-148			
Tetrachloroethene	935	6.2	25	"	1000	ND	94	64-148			
Toluene	1020	5.2	15	"	1000	ND	102	47-150			
1,1,1-Trichloroethane	1150	8.8	25	"	1000	ND	115	52-162			

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09163 - EPA 5030 Water MS

Matrix Spike (CX09163-MS1)

Source: CXL1250-01

Prepared & Analyzed: 12/24/14

1,1,2-Trichloroethane	937	4.9	25	µg/L	1000	ND	94	52-150			
Trichloroethene	1010	5.4	25	"	1000	ND	101	71-157			
Trichlorofluoromethane	762	9.8	25	"	1000	ND	76	47-181			
Vinyl chloride	585	8.7	25	"	1000	ND	58	10-251			

Matrix Spike Dup (CX09163-MSD1)

Source: CXL1250-01

Prepared & Analyzed: 12/24/14

Surrogate: 1,2-Dichloroethane-d4	9.81			µg/L	10.0		98	65-135			
Surrogate: Toluene-d8	9.40			"	10.0		94	72-125			
Surrogate: 4-Bromofluorobenzene	10.7			"	10.0		107	73-125			
Benzene	1050	2.9	15	"	1000	ND	105	37-151	2	30	
Bromodichloromethane	1060	3.1	25	"	1000	ND	106	35-155	3	30	
Bromoform	1010	8.1	25	"	1000	ND	101	45-169	3	30	
Bromomethane	847	10	25	"	1000	ND	85	10-242	14	30	
Carbon tetrachloride	2390	4.6	25	"	1000	ND	239	70-140	3	30	QM-7
Chlorobenzene	982	5.6	15	"	1000	ND	98	37-163	3	30	
Chloroethane	555	10	25	"	1000	ND	56	14-230	9	30	
Chloroform	1060	6.4	25	"	1000	ND	106	51-138	3	30	
Chloromethane	572	14	25	"	1000	ND	57	10-273	20	30	
Dibromochloromethane	1040	6.7	25	"	1000	ND	104	53-149	5	30	
1,2-Dichlorobenzene	993	2.1	15	"	1000	ND	99	18-190	4	30	
1,3-Dichlorobenzene	992	4.1	15	"	1000	ND	99	59-156	4	30	
1,4-Dichlorobenzene	991	3.1	15	"	1000	ND	99	18-190	4	30	
Dichlorodifluoromethane (Freon 12)	351	18	25	"	1000	ND	35	50-150	8	30	QM-7
1,1-Dichloroethane	1080	5.9	25	"	1000	ND	108	59-155	2	30	
1,2-Dichloroethane	1090	2.7	25	"	1000	ND	109	49-155	4	30	
1,1-Dichloroethene	809	4.6	25	"	1000	ND	81	5-234	4	30	
trans-1,2-Dichloroethene	1010	6.4	25	"	1000	ND	101	54-156	3	30	
1,2-Dichloropropane	1030	2.9	25	"	1000	ND	103	5-210	3	30	
cis-1,3-Dichloropropene	1070	4.9	25	"	1000	ND	107	5-227	4	30	
trans-1,3-Dichloropropene	1140	6.0	25	"	1000	ND	114	17-183	4	30	
Ethylbenzene	978	4.5	15	"	1000	ND	98	37-162	4	30	
Methylene chloride	994	12	25	"	1000	ND	99	5-221	3	30	
1,1,2,2-Tetrachloroethane	998	6.4	25	"	1000	ND	100	46-148	6	30	
Tetrachloroethene	969	6.2	25	"	1000	ND	97	64-148	4	30	
Toluene	1060	5.2	15	"	1000	ND	106	47-150	3	30	
1,1,1-Trichloroethane	1190	8.8	25	"	1000	ND	119	52-162	4	30	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Purgeables by EPA Method 624 - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch CX09163 - EPA 5030 Water MS

Matrix Spike Dup (CX09163-MSD1)

Source: CXL1250-01

Prepared & Analyzed: 12/24/14

1,1,2-Trichloroethane	988	4.9	25	µg/L	1000	ND	99	52-150	5	30	
Trichloroethene	1040	5.4	25	"	1000	ND	104	71-157	3	30	
Trichlorofluoromethane	827	9.8	25	"	1000	ND	83	47-181	8	30	
Vinyl chloride	663	8.7	25	"	1000	ND	66	10-251	12	30	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field CA, 94053-1000	Project: Q4 2014 NASA RGRP Extraction Well Sampling Project Number: 3602-212 Project Manager: Brian Reddig	CLS Work Order #: CXL1158 COC #:
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TPH-Gasoline by GC FID - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09177 - EPA 5030 Water GC

Blank (CX09177-BLK1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Chlorotoluene (Gas)	17.6			µg/L	20.0		88	65-135		
Gasoline	ND	10	50	"						

LCS (CX09177-BS1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Chlorotoluene (Gas)	19.5			µg/L	20.0		97	65-135		
Gasoline	439	10	50	"	500		88	70-130		

LCS Dup (CX09177-BSD1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Chlorotoluene (Gas)	19.7			µg/L	20.0		98	65-135		
Gasoline	448	10	50	"	500		90	70-130	2	30

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames	Project: Q4 2014 NASA RGRP Extraction Well Sampling	CLS Work Order #: CXL1158 COC #:
Bldg T20G-4, Room 135	Project Number: 3602-212	
Moffet Field CA, 94053-1000	Project Manager: Brian Reddig	

Volatile Organic Compounds by EPA Method 8260B - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX09163 - EPA 5030 Water MS

Blank (CX09163-BLK1)

Prepared & Analyzed: 12/24/14

<i>Surrogate: Toluene-d8</i>	11.7			µg/L	10.0		117	72-125			
Benzene	ND	0.11	0.50	"							
Toluene	ND	0.11	0.50	"							
Ethylbenzene	ND	0.10	0.50	"							
Xylenes (total)	ND	0.33	1.0	"							

LCS (CX09163-BS1)

Prepared & Analyzed: 12/24/14

<i>Surrogate: Toluene-d8</i>	9.09			µg/L	10.0		91	72-125			
Benzene	20.6	0.11	0.50	"	20.0		103	52-130			

LCS Dup (CX09163-BS1)

Prepared & Analyzed: 12/24/14

<i>Surrogate: Toluene-d8</i>	9.81			µg/L	10.0		98	72-125			
Benzene	20.7	0.11	0.50	"	20.0		103	52-130	0.3	30	

Matrix Spike (CX09163-MS1)

Source: CXL1250-01

Prepared & Analyzed: 12/24/14

<i>Surrogate: Toluene-d8</i>	9.34			µg/L	10.0		93	72-125			
Benzene	1020	5.7	25	"	1000	ND	102	52-140			

Matrix Spike Dup (CX09163-MSD1)

Source: CXL1250-01

Prepared & Analyzed: 12/24/14

<i>Surrogate: Toluene-d8</i>	9.40			µg/L	10.0		94	72-125			
Benzene	1050	5.7	25	"	1000	ND	105	52-140	2	30	

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CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

Notes and Definitions

QR-2	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
QC-4H	The percent recovery of LCS or LCSD was above the upper control limit; however, all analytes in the associated sample were ND; therefore, a reanalysis was not performed.
MS-L	The percent recovery of one LCS/LCSD was below the lower control limit; however, the other analytes were within limits and the batch was accepted on this basis.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

12/30/14 12:57

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: Q4 2014 NASA RGRP Extraction Well Sampling
Project Number: 3602-212
Project Manager: Brian Reddig

CLS Work Order #: CXL1158
COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY							CLS ID. NO. <u>CXL1158</u> (1 of 1)				
Report To:				Client Job Number 3602-212			ANALYSIS REQUESTED				
Name and Address Earth Resources Technology, Inc.				Destination Laboratory			GEOTRACKER				
NASA Ames Research Center				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com			EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO				
Moffett Field, CA				<input type="checkbox"/> OTHER			GLOBAL ID.				
Project Manager Brian Reddig (650) 604-1315				PRESERVATIVES VOCs (EPA 624) TPH-GBTEX TPH-D, -JP/58, -MO			FIELD CONDITIONS:				
Project Name Q4 2014 NASA RGRP Extraction Well Sampling							COMPOSITE:				
Sampled By Brian Reddig							TURNAROUND TIME IN DAYS		SPECIAL INSTRUCTIONS		
Job Description Q4 2014 NASA RGRP Sampling							1 2 5 10				
Site Location NASA RGRP											
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE					
12/22/14	11:36	NASA-1A		Groundwater	5	mixed	1,3	X	X	X	
12/22/14	11:57	NASA-3A		Groundwater	3	VOA	1	X			
							INVOICE TO:				
							PO:				
							QUOTES:				
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME		PRESERVATIVES (1) HCL (2) HNO ₃ (3) = COLD (4)		
RELINQUISHED BY (Signature)			PRINT NAME/COMPANY		DATE/TIME		RECEIVED BY (Signature)		PRINT NAME/COMPANY		
<i>Brian Reddig</i>			Brian Reddig/ERT		12/22/14 1:00 PM		<i>[Signature]</i>		CL		
RECEIVED AT LAB BY:			DATE/TIME:		CONDITIONS/COMMENTS:						
SHIPPED BY:			DATE/TIME:		CONDITIONS/COMMENTS:						
<input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER			12/22/14 1:00 PM		1.9		AIR BILL #				

CA DOHS ELAP Accreditation/Registration Number 1233

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Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

October 15, 2014

CLS Work Order #: CXJ0472

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

Moffet Field, CA 94053-1000

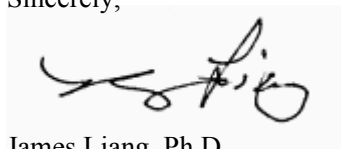
Project Name: 2014 Annual AOI 17

Grownwater Sampling

Enclosed are the results of analyses for samples received by the laboratory on 10/08/14 19:05. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Liang', is placed over a light gray rectangular background.

James Liang, Ph.D.

Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

Page 1 of 20

10/15/14 16:31

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472

COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY										CLS ID. NO. <u>CXJ0472</u> (of <u> </u>)	
Report To:				Client Job Number 3602-705				ANALYSIS REQUESTED			
Name and Address Earth Resources Technology, Inc.								PRESERVATIVES VOCs (EPA 624)			
NASA Ames Research Center				Destination Laboratory							
Moffett Field, CA				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com							
Project Manager Brian Reddig (650) 604-1315				<input type="checkbox"/> OTHER							
Project Name 2014 Annual AOI 17 Groundwater Sampling											
Sampled By Brian Reddig								GEOTRACKER EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO GLOBAL ID.			
Job Description 2014 Annual AOI 17 Groundwater Sampling								FIELD CONDITIONS: COMPOSITE:			
Site Location NASA RGRP								TURNAROUND TIME IN DAYS 1 2 5 10			
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE					SPECIAL INSTRUCTIONS
10/6/14	8:31	15A06A		Groundwater	3	VOA	1	X			X
10/6/14	8:49	15B03A		Groundwater	3	VOA	1	X			X
10/6/14	9:10	15B02A		Groundwater	3	VOA	1	X			X
10/6/14	9:33	10Q07A		Groundwater	3	VOA	1	X			X
10/6/14	10:04	PRB-31		Groundwater	3	VOA	1	X			X
10/6/14	10:21	MW-AS11		Groundwater	3	VOA	1	X			X
10/6/14	10:44	MW-AS13		Groundwater	3	VOA	1	X			X
10/6/14	11:05	MW-AS3		Groundwater	3	VOA	1	X			X
10/6/14	11:21	PRB-29		Groundwater	3	VOA	1	X			X
10/6/14	11:37	PRB-30		Groundwater	3	VOA	1	X			X
											PO#
											QUOTE#
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME		PRESERVATIVES (1) HCL (3) - COLD (2) HNO ₃ (4)		
RELINQUISHED BY (Signature)			PRINT NAME/COMPANY			DATE/TIME		RECEIVED BY (Signature)		PRINT NAME/COMPANY	
Brian Reddig			Brian Reddig/ERT			10/15/14		[Signature]		[Signature]	
RECEIVED AT LAB BY:							DATE/TIME:		CONDITIONS/COMMENTS:		
SHIPPED BY:							<input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER		AIR BILL #		
							10-82 1405		4-7		

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

www.californialab.com

916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15A06A (CXJ0472-01) Water Sampled: 10/06/14 08:31 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	0.97	0.50	"	"	"	"	"	"	

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10/15/14 16:31

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15A06A (CXJ0472-01) Water Sampled: 10/06/14 08:31 Received: 10/08/14 19:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	1.1	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		99 %		65-135	"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98 %		72-125	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		98 %		73-125	"	"	"	"	
15B03A (CXJ0472-02) Water Sampled: 10/06/14 08:49 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	14	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15B03A (CXJ0472-02) Water Sampled: 10/06/14 08:49 Received: 10/08/14 19:05									
1,2-Dichloropropane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	46	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	65-135	"	"	"	"
Surrogate: Toluene-d8	94 %	72-125	"	"	"	"
Surrogate: 4-Bromofluorobenzene	91 %	73-125	"	"	"	"

15B02A (CXJ0472-03) Water Sampled: 10/06/14 09:10 Received: 10/08/14 19:05

Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624
Bromodichloromethane	ND	0.50	"	"	"	"	"	"
Bromoform	ND	0.50	"	"	"	"	"	"
Bromomethane	ND	0.50	"	"	"	"	"	"
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"
Chlorobenzene	ND	0.30	"	"	"	"	"	"
Chloroethane	ND	0.50	"	"	"	"	"	"
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"
Chloroform	ND	0.50	"	"	"	"	"	"

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15B02A (CXJ0472-03) Water Sampled: 10/06/14 09:10 Received: 10/08/14 19:05									
Chloromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	8.8	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	0.67	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	46	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
<hr/>									
Surrogate: 1,2-Dichloroethane-d4		105 %		65-135	"	"	"	"	
Surrogate: Toluene-d8		97 %		72-125	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94 %		73-125	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
10Q07A (CXJ0472-04) Water Sampled: 10/06/14 09:33 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	20	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	1.3	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	16	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
10Q07A (CXJ0472-04) Water Sampled: 10/06/14 09:33 Received: 10/08/14 19:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

102 % 65-135

"

"

"

"

Surrogate: Toluene-d8

95 % 72-125

"

"

"

"

Surrogate: 4-Bromofluorobenzene

92 % 73-125

"

"

"

"

PRB-31 (CXJ0472-05) Water

Sampled: 10/06/14 10:04 Received: 10/08/14 19:05

Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	29	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PRB-31 (CXJ0472-05) Water Sampled: 10/06/14 10:04 Received: 10/08/14 19:05									
1,2-Dichloropropane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	74	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

103 % 65-135

"

"

"

"

Surrogate: Toluene-d8

98 % 72-125

"

"

"

"

Surrogate: 4-Bromofluorobenzene

95 % 73-125

"

"

"

"

MW-AS11 (CXJ0472-06) Water Sampled: 10/06/14 10:21 Received: 10/08/14 19:05

Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS11 (CXJ0472-06) Water Sampled: 10/06/14 10:21 Received: 10/08/14 19:05									
Chloromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	10	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	0.68	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	37	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
<hr/>									
Surrogate: 1,2-Dichloroethane-d4		110 %		65-135	"	"	"	"	
Surrogate: Toluene-d8		95 %		72-125	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94 %		73-125	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS13 (CXJ0472-07) Water Sampled: 10/06/14 10:44 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	20	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	0.79	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	58	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS13 (CXJ0472-07) Water Sampled: 10/06/14 10:44 Received: 10/08/14 19:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

108 % 65-135

"

"

"

"

Surrogate: Toluene-d8

98 % 72-125

"

"

"

"

Surrogate: 4-Bromofluorobenzene

96 % 73-125

"

"

"

"

MW-AS3 (CXJ0472-08) Water Sampled: 10/06/14 11:05 Received: 10/08/14 19:05

Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	9.2	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	0.66	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS3 (CXJ0472-08) Water Sampled: 10/06/14 11:05 Received: 10/08/14 19:05									
1,2-Dichloropropane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	25	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

108 %

65-135

"

"

"

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Surrogate: Toluene-d8

95 %

72-125

"

"

"

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Surrogate: 4-Bromofluorobenzene

93 %

73-125

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PRB-29 (CXJ0472-09) Water

Sampled: 10/06/14 11:21 Received: 10/08/14 19:05

Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PRB-29 (CXJ0472-09) Water Sampled: 10/06/14 11:21 Received: 10/08/14 19:05									
Chloromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	19	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	1.4	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	52	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

107 % 65-135

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Surrogate: Toluene-d8

94 % 72-125

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Surrogate: 4-Bromofluorobenzene

93 % 73-125

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PRB-30 (CXJ0472-10) Water Sampled: 10/06/14 11:37 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07267	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	35	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	2.1	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	90	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PRB-30 (CXJ0472-10) Water Sampled: 10/06/14 11:37 Received: 10/08/14 19:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX07267	"	10/09/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		102 %		65-135	"	"	"	"	
Surrogate: Toluene-d8		94 %		72-125	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94 %		73-125	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07267 - EPA 5030 Water MS

Blank (CX07267-BLK1)

Prepared & Analyzed: 10/09/14

Benzene	ND	0.30	µg/L
Bromodichloromethane	ND	0.50	"
Bromoform	ND	0.50	"
Bromomethane	ND	0.50	"
Carbon tetrachloride	ND	0.50	"
Chlorobenzene	ND	0.30	"
Chloroethane	ND	0.50	"
2-Chloroethylvinyl ether	ND	2.0	"
Chloroform	ND	0.50	"
Chloromethane	ND	0.50	"
Dibromochloromethane	ND	0.50	"
1,2-Dichlorobenzene	ND	0.30	"
1,3-Dichlorobenzene	ND	0.30	"
1,4-Dichlorobenzene	ND	0.30	"
Dichlorodifluoromethane (Freon 12)	ND	0.50	"
1,1-Dichloroethane	ND	0.50	"
1,2-Dichloroethane	ND	0.50	"
1,1-Dichloroethene	ND	0.50	"
cis-1,2-Dichloroethene	ND	0.50	"
trans-1,2-Dichloroethene	ND	0.50	"
1,2-Dichloropropane	ND	0.50	"
cis-1,3-Dichloropropene	ND	0.50	"
trans-1,3-Dichloropropene	ND	0.50	"
Ethylbenzene	ND	0.30	"
Methylene chloride	ND	0.50	"
1,1,2,2-Tetrachloroethane	ND	0.50	"
Tetrachloroethene	ND	0.50	"
Toluene	ND	0.30	"
1,1,1-Trichloroethane	ND	0.50	"
1,1,2-Trichloroethane	ND	0.50	"
Trichloroethene	ND	0.50	"

CA DOHS ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07267 - EPA 5030 Water MS

Blank (CX07267-BLK1)

Prepared & Analyzed: 10/09/14

Trichlorofluoromethane	ND	0.50	µg/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"							
Vinyl chloride	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	11.3		"	10.0		113	65-135			
Surrogate: Toluene-d8	9.43		"	10.0		94	72-125			
Surrogate: 4-Bromofluorobenzene	9.12		"	10.0		91	73-125			

LCS (CX07267-BS1)

Prepared & Analyzed: 10/09/14

Benzene	19.9	0.30	µg/L	20.0		99	37-151			
Bromodichloromethane	19.5	0.50	"	20.0		97	35-155			
Bromoform	16.2	0.50	"	20.0		81	45-169			
Bromomethane	22.0	0.50	"	20.0		110	10-242			
Carbon tetrachloride	17.7	0.50	"	20.0		89	70-140			
Chlorobenzene	16.2	0.30	"	20.0		81	37-160			
Chloroethane	28.1	0.50	"	20.0		141	14-230			
Chloroform	22.2	0.50	"	20.0		111	51-138			
Chloromethane	21.1	0.50	"	20.0		106	10-273			
Dibromochloromethane	19.0	0.50	"	20.0		95	53-149			
1,2-Dichlorobenzene	17.7	0.30	"	20.0		88	18-190			
1,3-Dichlorobenzene	16.8	0.30	"	20.0		84	59-156			
1,4-Dichlorobenzene	17.5	0.30	"	20.0		88	18-190			
Dichlorodifluoromethane (Freon 12)	20.7	0.50	"	20.0		103	50-150			
1,1-Dichloroethane	21.7	0.50	"	20.0		108	59-155			
1,2-Dichloroethane	25.5	0.50	"	20.0		127	49-155			
1,1-Dichloroethene	21.6	0.50	"	20.0		108	5-234			
trans-1,2-Dichloroethene	24.0	0.50	"	20.0		120	54-156			
1,2-Dichloropropane	21.9	0.50	"	20.0		110	5-210			
cis-1,3-Dichloropropene	20.0	0.50	"	20.0		100	5-227			
trans-1,3-Dichloropropene	18.7	0.50	"	20.0		93	17-183			
Ethylbenzene	17.3	0.30	"	20.0		87	37-162			

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07267 - EPA 5030 Water MS

LCS (CX07267-BS1)

Prepared & Analyzed: 10/09/14

Methylene chloride	22.6	0.50	µg/L	20.0		113	5-221			
1,1,2,2-Tetrachloroethane	21.8	0.50	"	20.0		109	46-148			
Tetrachloroethene	16.0	0.50	"	20.0		80	64-148			
Toluene	19.6	0.30	"	20.0		98	47-150			
1,1,1-Trichloroethane	22.2	0.50	"	20.0		111	52-162			
1,1,2-Trichloroethane	21.5	0.50	"	20.0		107	52-150			
Trichloroethene	19.1	0.50	"	20.0		96	71-157			
Trichlorofluoromethane	23.6	0.50	"	20.0		118	47-181			
Vinyl chloride	20.6	0.50	"	20.0		103	10-251			
Surrogate: 1,2-Dichloroethane-d4	10.1		"	10.0		101	65-135			
Surrogate: Toluene-d8	9.51		"	10.0		95	72-125			
Surrogate: 4-Bromofluorobenzene	10.7		"	10.0		107	73-125			

LCS Dup (CX07267-BSD1)

Prepared & Analyzed: 10/09/14

Benzene	19.8	0.30	µg/L	20.0		99	37-151	0.2	30	
Bromodichloromethane	19.5	0.50	"	20.0		97	35-155	0.05	30	
Bromoform	16.3	0.50	"	20.0		82	45-169	0.6	30	
Bromomethane	28.0	0.50	"	20.0		140	10-242	24	30	
Carbon tetrachloride	17.1	0.50	"	20.0		86	70-140	3	30	
Chlorobenzene	16.6	0.30	"	20.0		83	37-160	3	30	
Chloroethane	20.8	0.50	"	20.0		104	14-230	30	30	
Chloroform	21.4	0.50	"	20.0		107	51-138	4	30	
Chloromethane	18.1	0.50	"	20.0		91	10-273	15	30	
Dibromochloromethane	18.3	0.50	"	20.0		92	53-149	3	30	
1,2-Dichlorobenzene	16.2	0.30	"	20.0		81	18-190	9	30	
1,3-Dichlorobenzene	15.2	0.30	"	20.0		76	59-156	10	30	
1,4-Dichlorobenzene	15.6	0.30	"	20.0		78	18-190	12	30	
Dichlorodifluoromethane (Freon 12)	19.7	0.50	"	20.0		98	50-150	5	30	
1,1-Dichloroethane	22.9	0.50	"	20.0		114	59-155	5	30	
1,2-Dichloroethane	25.4	0.50	"	20.0		127	49-155	0.1	30	
1,1-Dichloroethene	18.6	0.50	"	20.0		93	5-234	15	30	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX07267 - EPA 5030 Water MS

LCS Dup (CX07267-BSD1)

Prepared & Analyzed: 10/09/14

trans-1,2-Dichloroethene	22.4	0.50	µg/L	20.0		112	54-156	7	30	
1,2-Dichloropropane	22.1	0.50	"	20.0		110	5-210	0.7	30	
cis-1,3-Dichloropropene	19.7	0.50	"	20.0		99	5-227	1	30	
trans-1,3-Dichloropropene	18.9	0.50	"	20.0		95	17-183	1	30	
Ethylbenzene	18.0	0.30	"	20.0		90	37-162	4	30	
Methylene chloride	22.5	0.50	"	20.0		113	5-221	0.3	30	
1,1,2,2-Tetrachloroethane	19.3	0.50	"	20.0		97	46-148	12	30	
Tetrachloroethene	16.4	0.50	"	20.0		82	64-148	3	30	
Toluene	19.4	0.30	"	20.0		97	47-150	1	30	
1,1,1-Trichloroethane	20.9	0.50	"	20.0		104	52-162	6	30	
1,1,2-Trichloroethane	21.4	0.50	"	20.0		107	52-150	0.7	30	
Trichloroethene	19.2	0.50	"	20.0		96	71-157	0.5	30	
Trichlorofluoromethane	22.3	0.50	"	20.0		112	47-181	6	30	
Vinyl chloride	21.7	0.50	"	20.0		109	10-251	5	30	
Surrogate: 1,2-Dichloroethane-d4	10.6		"	10.0		106	65-135			
Surrogate: Toluene-d8	9.48		"	10.0		95	72-125			
Surrogate: 4-Bromofluorobenzene	9.37		"	10.0		94	73-125			

CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0472
COC #:

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

October 15, 2014

CLS Work Order #: CXJ0474
COC #:

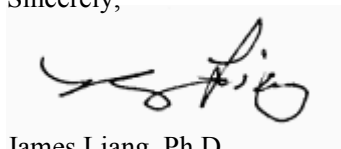
Brian Reddig
Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project Name: 2014 Annual AOI 17
Groundwater Sampling

Enclosed are the results of analyses for samples received by the laboratory on 10/08/14 19:05. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is placed over a light gray rectangular background.

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

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10/15/14 16:32

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474

COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY							CLS ID. NO. <u>650474</u> (of <u> </u>)			
Report To:				Client Job Number 3602-705			ANALYSIS REQUESTED			
Name and Address Earth Resources Technology, Inc.							GEOTRACKER			
NASA Ames Research Center				Destination Laboratory			EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO			
Moffett Field, CA				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com <input type="checkbox"/> OTHER			GLOBAL ID.			
Project Manager Brian Reddig (650) 604-1315							FIELD CONDITIONS:			
Project Name 2014 Annual AOI 17 Groundwater Sampling							COMPOSITE:			
Sampled By Brian Reddig							TURNAROUND TIME IN DAYS		SPECIAL INSTRUCTIONS	
Job Description 2014 Annual AOI 17 Groundwater Sampling							1 2 5 10			
Site Location NASA RGRP										
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE	PRESERVATIVES			
10/7/14	8:42	12L01A		Groundwater	3	VOA	1	X		
10/7/14	9:09	15B06A		Groundwater	3	VOA	1	X		
10/7/14	9:30	PRB-25		Groundwater	3	VOA	1	X		
10/7/14	9:49	MW-AS4		Groundwater	3	VOA	1	X		
10/7/14	10:06	MW-AS8		Groundwater	3	VOA	1	X		
							INVOICE TO:			
							PO#			
							QUOTE#			
SUSPECTED CONSTITUENTS							SAMPLE RETENTION TIME			
RELINQUISHED BY (Signature)			PRINT NAME/COMPANY		DATE/TIME		RECEIVED BY (Signature)			
<i>Brian Reddig</i>			Brian Reddig/ERT		10/14/14		<i>[Signature]</i>			
RECEIVED AT LAB BY:			DATE/TIME:		10/14/14		CONDITIONS/COMMENTS:			
SHIPPED BY:			<input checked="" type="checkbox"/> FED EX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER		AIR BILL #					

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742

www.californialab.com

916-638-7301

Fax: 916-638-4510

CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
12L01A (CXJ0474-01) Water Sampled: 10/07/14 08:42 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07205	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	4.6	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	27	0.50	"	"	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
12L01A (CXJ0474-01) Water Sampled: 10/07/14 08:42 Received: 10/08/14 19:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX07205	"	10/09/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		70 %		65-135	"	"	"	"	
<i>Surrogate: Toluene-d8</i>		83 %		72-125	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		121 %		73-125	"	"	"	"	
15B06A (CXJ0474-02) Water Sampled: 10/07/14 09:09 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07205	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	15	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	1.0	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15B06A (CXJ0474-02) Water Sampled: 10/07/14 09:09 Received: 10/08/14 19:05									
1,2-Dichloropropane	ND	0.50	µg/L	1	CX07205	"	10/09/14	EPA 624	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	94	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>71 %</i>	<i>65-135</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>Surrogate: Toluene-d8</i>	<i>82 %</i>	<i>72-125</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>119 %</i>	<i>73-125</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>

PRB-25 (CXJ0474-03) Water Sampled: 10/07/14 09:30 Received: 10/08/14 19:05

Benzene	ND	0.30	µg/L	1	CX07205	10/09/14	10/09/14	EPA 624
Bromodichloromethane	ND	0.50	"	"	"	"	"	"
Bromoform	ND	0.50	"	"	"	"	"	"
Bromomethane	ND	0.50	"	"	"	"	"	"
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"
Chlorobenzene	ND	0.30	"	"	"	"	"	"
Chloroethane	ND	0.50	"	"	"	"	"	"
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"
Chloroform	ND	0.50	"	"	"	"	"	"

CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PRB-25 (CXJ0474-03) Water Sampled: 10/07/14 09:30 Received: 10/08/14 19:05									
Chloromethane	ND	0.50	µg/L	1	CX07205	"	10/09/14	EPA 624	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	14	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	4.8	0.50	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
<hr/>									
Surrogate: 1,2-Dichloroethane-d4		70 %		65-135	"	"	"	"	
Surrogate: Toluene-d8		82 %		72-125	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		123 %		73-125	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

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10/15/14 16:32

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS4 (CXJ0474-04) Water Sampled: 10/07/14 09:49 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07205	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	47	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	2.5	0.50	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.50	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	89	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS4 (CXJ0474-04) Water Sampled: 10/07/14 09:49 Received: 10/08/14 19:05									
Trichlorofluoromethane	ND	0.50	µg/L	1	CX07205	"	10/09/14	EPA 624	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		75 %		65-135	"	"	"	"	
<i>Surrogate: Toluene-d8</i>		81 %		72-125	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		122 %		73-125	"	"	"	"	
MW-AS8 (CXJ0474-05) Water Sampled: 10/07/14 10:06 Received: 10/08/14 19:05									
Benzene	ND	0.30	µg/L	1	CX07205	10/09/14	10/09/14	EPA 624	
Bromodichloromethane	ND	0.50	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
Bromomethane	ND	0.50	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.50	"	"	"	"	"	"	
Chlorobenzene	ND	0.30	"	"	"	"	"	"	
Chloroethane	ND	0.50	"	"	"	"	"	"	
2-Chloroethylvinyl ether	ND	2.0	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Chloromethane	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.30	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.50	"	"	"	"	"	"	
cis-1,2-Dichloroethene	86	0.50	"	"	"	"	"	"	
trans-1,2-Dichloroethene	2.7	0.50	"	"	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-AS8 (CXJ0474-05) Water Sampled: 10/07/14 10:06 Received: 10/08/14 19:05									
1,2-Dichloropropane	ND	0.50	µg/L	1	CX07205	"	10/09/14	EPA 624	
cis-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.30	"	"	"	"	"	"	
Methylene chloride	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.30	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Trichloroethene	180	2.5	"	5	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	1	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"	"	"	"	"	"	
Vinyl chloride	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

71 %

65-135

"

"

"

"

Surrogate: Toluene-d8

83 %

72-125

"

"

"

"

Surrogate: 4-Bromofluorobenzene

125 %

73-125

"

"

"

"

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07205 - EPA 5030 Water MS

Blank (CX07205-BLK1)

Prepared & Analyzed: 10/09/14

Benzene	ND	0.30	µg/L
Bromodichloromethane	ND	0.50	"
Bromoform	ND	0.50	"
Bromomethane	ND	0.50	"
Carbon tetrachloride	ND	0.50	"
Chlorobenzene	ND	0.30	"
Chloroethane	ND	0.50	"
2-Chloroethylvinyl ether	ND	2.0	"
Chloroform	ND	0.50	"
Chloromethane	ND	0.50	"
Dibromochloromethane	ND	0.50	"
1,2-Dichlorobenzene	ND	0.30	"
1,3-Dichlorobenzene	ND	0.30	"
1,4-Dichlorobenzene	ND	0.30	"
Dichlorodifluoromethane (Freon 12)	ND	0.50	"
1,1-Dichloroethane	ND	0.50	"
1,2-Dichloroethane	ND	0.50	"
1,1-Dichloroethene	ND	0.50	"
cis-1,2-Dichloroethene	ND	0.50	"
trans-1,2-Dichloroethene	ND	0.50	"
1,2-Dichloropropane	ND	0.50	"
cis-1,3-Dichloropropene	ND	0.50	"
trans-1,3-Dichloropropene	ND	0.50	"
Ethylbenzene	ND	0.30	"
Methylene chloride	ND	0.50	"
1,1,2,2-Tetrachloroethane	ND	0.50	"
Tetrachloroethene	ND	0.50	"
Toluene	ND	0.30	"
1,1,1-Trichloroethane	ND	0.50	"
1,1,2-Trichloroethane	ND	0.50	"
Trichloroethene	ND	0.50	"

CA DOHS ELAP Accreditation/Registration Number 1233

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07205 - EPA 5030 Water MS

Blank (CX07205-BLK1)

Prepared & Analyzed: 10/09/14

Trichlorofluoromethane	ND	0.50	µg/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"							
Vinyl chloride	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	6.80		"	10.0		68	65-135			
Surrogate: Toluene-d8	8.21		"	10.0		82	72-125			
Surrogate: 4-Bromofluorobenzene	13.6		"	10.0		136	73-125			QS-HI

LCS (CX07205-BS1)

Prepared & Analyzed: 10/09/14

Benzene	18.6	0.30	µg/L	20.0		93	37-151			
Bromodichloromethane	18.6	0.50	"	20.0		93	35-155			
Bromoform	17.6	0.50	"	20.0		88	45-169			
Bromomethane	17.4	0.50	"	20.0		87	10-242			
Carbon tetrachloride	18.4	0.50	"	20.0		92	70-140			
Chlorobenzene	17.9	0.30	"	20.0		89	37-160			
Chloroethane	24.2	0.50	"	20.0		121	14-230			
Chloroform	16.9	0.50	"	20.0		84	51-138			
Chloromethane	11.1	0.50	"	20.0		55	10-273			
Dibromochloromethane	18.7	0.50	"	20.0		93	53-149			
1,2-Dichlorobenzene	19.3	0.30	"	20.0		97	18-190			
1,3-Dichlorobenzene	19.3	0.30	"	20.0		96	59-156			
1,4-Dichlorobenzene	19.3	0.30	"	20.0		96	18-190			
Dichlorodifluoromethane (Freon 12)	21.7	0.50	"	20.0		109	50-150			
1,1-Dichloroethane	18.8	0.50	"	20.0		94	59-155			
1,2-Dichloroethane	19.9	0.50	"	20.0		99	49-155			
1,1-Dichloroethene	16.7	0.50	"	20.0		83	5-234			
trans-1,2-Dichloroethene	17.3	0.50	"	20.0		86	54-156			
1,2-Dichloropropane	17.9	0.50	"	20.0		89	5-210			
cis-1,3-Dichloropropene	19.5	0.50	"	20.0		98	5-227			
trans-1,3-Dichloropropene	21.5	0.50	"	20.0		108	17-183			
Ethylbenzene	19.7	0.30	"	20.0		99	37-162			

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07205 - EPA 5030 Water MS

LCS (CX07205-BS1)

Prepared & Analyzed: 10/09/14

Methylene chloride	15.1	0.50	µg/L	20.0		76	5-221			
1,1,2,2-Tetrachloroethane	18.0	0.50	"	20.0		90	46-148			
Tetrachloroethene	19.6	0.50	"	20.0		98	64-148			
Toluene	19.0	0.30	"	20.0		95	47-150			
1,1,1-Trichloroethane	20.2	0.50	"	20.0		101	52-162			
1,1,2-Trichloroethane	19.4	0.50	"	20.0		97	52-150			
Trichloroethene	20.2	0.50	"	20.0		101	71-157			
Trichlorofluoromethane	19.8	0.50	"	20.0		99	47-181			
Vinyl chloride	17.9	0.50	"	20.0		89	10-251			
Surrogate: 1,2-Dichloroethane-d4	8.66		"	10.0		87	65-135			
Surrogate: Toluene-d8	8.60		"	10.0		86	72-125			
Surrogate: 4-Bromofluorobenzene	11.6		"	10.0		116	73-125			

LCS Dup (CX07205-BSD1)

Prepared & Analyzed: 10/09/14

Benzene	17.6	0.30	µg/L	20.0		88	37-151	6	30	
Bromodichloromethane	17.4	0.50	"	20.0		87	35-155	7	30	
Bromoform	16.7	0.50	"	20.0		84	45-169	5	30	
Bromomethane	17.5	0.50	"	20.0		88	10-242	0.8	30	
Carbon tetrachloride	17.5	0.50	"	20.0		87	70-140	5	30	
Chlorobenzene	17.0	0.30	"	20.0		85	37-160	5	30	
Chloroethane	21.5	0.50	"	20.0		107	14-230	12	30	
Chloroform	15.9	0.50	"	20.0		80	51-138	6	30	
Chloromethane	10.6	0.50	"	20.0		53	10-273	4	30	
Dibromochloromethane	17.5	0.50	"	20.0		88	53-149	7	30	
1,2-Dichlorobenzene	18.1	0.30	"	20.0		90	18-190	7	30	
1,3-Dichlorobenzene	18.2	0.30	"	20.0		91	59-156	6	30	
1,4-Dichlorobenzene	18.2	0.30	"	20.0		91	18-190	6	30	
Dichlorodifluoromethane (Freon 12)	19.8	0.50	"	20.0		99	50-150	9	30	
1,1-Dichloroethane	17.6	0.50	"	20.0		88	59-155	6	30	
1,2-Dichloroethane	19.0	0.50	"	20.0		95	49-155	4	30	
1,1-Dichloroethene	15.9	0.50	"	20.0		79	5-234	5	30	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07205 - EPA 5030 Water MS

LCS Dup (CX07205-BSD1)

Prepared & Analyzed: 10/09/14

trans-1,2-Dichloroethene	16.4	0.50	µg/L	20.0		82	54-156	5	30	
1,2-Dichloropropane	16.8	0.50	"	20.0		84	5-210	6	30	
cis-1,3-Dichloropropene	18.3	0.50	"	20.0		92	5-227	6	30	
trans-1,3-Dichloropropene	19.9	0.50	"	20.0		99	17-183	8	30	
Ethylbenzene	19.1	0.30	"	20.0		95	37-162	3	30	
Methylene chloride	13.8	0.50	"	20.0		69	5-221	9	30	
1,1,2,2-Tetrachloroethane	16.8	0.50	"	20.0		84	46-148	7	30	
Tetrachloroethene	18.4	0.50	"	20.0		92	64-148	6	30	
Toluene	17.9	0.30	"	20.0		90	47-150	6	30	
1,1,1-Trichloroethane	19.2	0.50	"	20.0		96	52-162	5	30	
1,1,2-Trichloroethane	18.1	0.50	"	20.0		90	52-150	7	30	
Trichloroethene	19.3	0.50	"	20.0		97	71-157	4	30	
Trichlorofluoromethane	20.5	0.50	"	20.0		102	47-181	3	30	
Vinyl chloride	16.5	0.50	"	20.0		83	10-251	8	30	
Surrogate: 1,2-Dichloroethane-d4	8.60		"	10.0		86	65-135			
Surrogate: Toluene-d8	8.53		"	10.0		85	72-125			
Surrogate: 4-Bromofluorobenzene	11.5		"	10.0		115	73-125			

Matrix Spike (CX07205-MS1)

Source: CXJ0372-01

Prepared & Analyzed: 10/09/14

Benzene	18.2	0.30	µg/L	20.0	ND	91	37-151			
Bromodichloromethane	17.7	0.50	"	20.0	ND	88	35-155			
Bromoform	15.5	0.50	"	20.0	ND	77	45-169			
Bromomethane	19.1	0.50	"	20.0	ND	95	10-242			
Carbon tetrachloride	18.3	0.50	"	20.0	ND	91	70-140			
Chlorobenzene	17.6	0.30	"	20.0	ND	88	37-163			
Chloroethane	20.7	0.50	"	20.0	ND	103	14-230			
Chloroform	16.9	0.50	"	20.0	ND	85	51-138			
Chloromethane	14.4	0.50	"	20.0	ND	72	10-273			
Dibromochloromethane	18.1	0.50	"	20.0	ND	90	53-149			
1,2-Dichlorobenzene	17.8	0.30	"	20.0	ND	89	18-190			
1,3-Dichlorobenzene	18.2	0.30	"	20.0	ND	91	59-156			

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch CX07205 - EPA 5030 Water MS

Matrix Spike (CX07205-MS1)	Source: CXJ0372-01			Prepared & Analyzed: 10/09/14						
1,4-Dichlorobenzene	18.0	0.30	µg/L	20.0	ND	90	18-190			
Dichlorodifluoromethane (Freon 12)	18.5	0.50	"	20.0	ND	93	50-150			
1,1-Dichloroethane	17.9	0.50	"	20.0	ND	89	59-155			
1,2-Dichloroethane	19.0	0.50	"	20.0	ND	95	49-155			
1,1-Dichloroethene	12.7	0.50	"	20.0	ND	64	5-234			
trans-1,2-Dichloroethene	15.5	0.50	"	20.0	ND	77	54-156			
1,2-Dichloropropane	17.2	0.50	"	20.0	ND	86	5-210			
cis-1,3-Dichloropropene	17.9	0.50	"	20.0	ND	90	5-227			
trans-1,3-Dichloropropene	19.5	0.50	"	20.0	ND	98	17-183			
Ethylbenzene	19.6	0.30	"	20.0	ND	98	37-162			
Methylene chloride	13.1	0.50	"	20.0	ND	65	5-221			
1,1,2,2-Tetrachloroethane	16.5	0.50	"	20.0	ND	82	46-148			
Tetrachloroethene	20.2	0.50	"	20.0	ND	101	64-148			
Toluene	19.4	0.30	"	20.0	ND	97	47-150			
1,1,1-Trichloroethane	19.8	0.50	"	20.0	ND	99	52-162			
1,1,2-Trichloroethane	19.6	0.50	"	20.0	ND	98	52-150			
Trichloroethene	20.4	0.50	"	20.0	ND	102	71-157			
Trichlorofluoromethane	21.0	0.50	"	20.0	ND	105	47-181			
Vinyl chloride	18.2	0.50	"	20.0	ND	91	10-251			
Surrogate: 1,2-Dichloroethane-d4	8.53		"	10.0		85	65-135			
Surrogate: Toluene-d8	8.81		"	10.0		88	72-125			
Surrogate: 4-Bromofluorobenzene	11.2		"	10.0		112	73-125			

Matrix Spike Dup (CX07205-MSD1)	Source: CXJ0372-01			Prepared & Analyzed: 10/09/14						
Benzene	19.3	0.30	µg/L	20.0	ND	96	37-151	6	30	
Bromodichloromethane	18.7	0.50	"	20.0	ND	93	35-155	6	30	
Bromoform	16.9	0.50	"	20.0	ND	84	45-169	9	30	
Bromomethane	23.7	0.50	"	20.0	ND	119	10-242	22	30	
Carbon tetrachloride	19.2	0.50	"	20.0	ND	96	70-140	5	30	
Chlorobenzene	18.7	0.30	"	20.0	ND	94	37-163	6	30	
Chloroethane	22.2	0.50	"	20.0	ND	111	14-230	7	30	

CALIFORNIA LABORATORY SERVICES

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10/15/14 16:32

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Purgeables by EPA Method 624 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CX07205 - EPA 5030 Water MS										
Matrix Spike Dup (CX07205-MSD1)	Source: CXJ0372-01			Prepared & Analyzed: 10/09/14						
Chloroform	17.6	0.50	µg/L	20.0	ND	88	51-138	4	30	
Chloromethane	10.3	0.50	"	20.0	ND	51	10-273	34	30	QM-7
Dibromochloromethane	18.9	0.50	"	20.0	ND	94	53-149	4	30	
1,2-Dichlorobenzene	19.9	0.30	"	20.0	ND	100	18-190	11	30	
1,3-Dichlorobenzene	20.3	0.30	"	20.0	ND	101	59-156	10	30	
1,4-Dichlorobenzene	19.9	0.30	"	20.0	ND	100	18-190	10	30	
Dichlorodifluoromethane (Freon 12)	20.3	0.50	"	20.0	ND	101	50-150	9	30	
1,1-Dichloroethane	18.5	0.50	"	20.0	ND	92	59-155	3	30	
1,2-Dichloroethane	19.4	0.50	"	20.0	ND	97	49-155	2	30	
1,1-Dichloroethene	13.6	0.50	"	20.0	ND	68	5-234	6	30	
trans-1,2-Dichloroethene	16.3	0.50	"	20.0	ND	81	54-156	5	30	
1,2-Dichloropropane	18.1	0.50	"	20.0	ND	91	5-210	5	30	
cis-1,3-Dichloropropene	19.0	0.50	"	20.0	ND	95	5-227	6	30	
trans-1,3-Dichloropropene	20.4	0.50	"	20.0	ND	102	17-183	5	30	
Ethylbenzene	21.1	0.30	"	20.0	ND	105	37-162	7	30	
Methylene chloride	13.4	0.50	"	20.0	ND	67	5-221	3	30	
1,1,2,2-Tetrachloroethane	18.2	0.50	"	20.0	ND	91	46-148	10	30	
Tetrachloroethene	21.5	0.50	"	20.0	ND	107	64-148	6	30	
Toluene	20.4	0.30	"	20.0	ND	102	47-150	5	30	
1,1,1-Trichloroethane	20.8	0.50	"	20.0	ND	104	52-162	5	30	
1,1,2-Trichloroethane	20.2	0.50	"	20.0	ND	101	52-150	3	30	
Trichloroethene	21.7	0.50	"	20.0	ND	108	71-157	6	30	
Trichlorofluoromethane	23.3	0.50	"	20.0	ND	116	47-181	11	30	
Vinyl chloride	19.7	0.50	"	20.0	ND	98	10-251	7	30	
Surrogate: 1,2-Dichloroethane-d4	8.48		"	10.0		85	65-135			
Surrogate: Toluene-d8	8.73		"	10.0		87	72-125			
Surrogate: 4-Bromofluorobenzene	11.7		"	10.0		117	73-125			

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10/15/14 16:32

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field, CA 94053-1000

Project: 2014 Annual AOI 17 Groundwater Sampling
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXJ0474
COC #:

Notes and Definitions

QS-HI	Surrogate recovery was greater than the upper control limit. A reanalysis was not performed since the analytes associated with the surrogate were not detected.
QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

30 December 2014

CLS Work Order #: CXL1159

COC #:

Brian Reddig

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

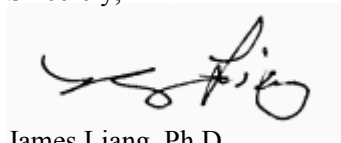
Moffet Field, CA 94053-1000

Project Name: AOI 4 Quarterly O&M

Enclosed are the results of analyses for samples received by the laboratory on 12/22/14 17:20. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed below as well as under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Liang', is written over a light gray rectangular background.

James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

12/30/14 11:28

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXL1159-01) Water Sampled: 12/22/14 09:30 Received: 12/22/14 17:20										
<i>Surrogate: o-Terphenyl</i>	<i>118 %</i>		<i>65-135</i>	mg/L		<i>CX09174</i>	12/24/14	12/26/14	<i>EPA 8015M</i>	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	ND	0.020	0.050	"	1	"	"	"	"	
Motor Oil	0.19	0.0091	0.050	"	1	"	"	"	"	
TANK1-E (CXL1159-02) Water Sampled: 12/22/14 09:45 Received: 12/22/14 17:20										
<i>Surrogate: o-Terphenyl</i>	<i>95 %</i>		<i>65-135</i>	mg/L		<i>CX09174</i>	12/24/14	12/26/14	<i>EPA 8015M</i>	
Diesel	ND	0.0021	0.050	"	1	"	"	"	"	
JP-5/JP-8	ND	0.020	0.050	"	1	"	"	"	"	
Motor Oil	0.17	0.0091	0.050	"	1	"	"	"	"	
15A11A (CXL1159-03) Water Sampled: 12/22/14 10:50 Received: 12/22/14 17:20										
<i>Surrogate: o-Terphenyl</i>	<i>124 %</i>		<i>65-135</i>	mg/L		<i>CX09174</i>	12/24/14	12/26/14	<i>EPA 8015M</i>	
Diesel	0.32	0.0021	0.050	"	1	"	"	"	"	TPH-X
JP-5/JP-8	ND	0.020	0.050	"	1	"	"	"	"	
Motor Oil	ND	0.0091	0.050	"	1	"	"	"	"	

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

TPH-Gasoline by GC FID

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXL1159-01) Water Sampled: 12/22/14 09:30 Received: 12/22/14 17:20										
Surrogate: <i>o</i> -Chlorotoluene (Gas)	102 %		65-135	µg/L		CX09177	12/24/14	12/26/14	EPA 8015M	
Gasoline	26	10	50	"	1	"	"	"	"	J
TANK1-E (CXL1159-02) Water Sampled: 12/22/14 09:45 Received: 12/22/14 17:20										
Surrogate: <i>o</i> -Chlorotoluene (Gas)	88 %		65-135	µg/L		CX09177	12/24/14	12/26/14	EPA 8015M	
Gasoline	ND	10	50	"	1	"	"	"	"	
15A11A (CXL1159-03) Water Sampled: 12/22/14 10:50 Received: 12/22/14 17:20										
Surrogate: <i>o</i> -Chlorotoluene (Gas)	99 %		65-135	µg/L		CX09177	12/24/14	12/26/14	EPA 8015M	
Gasoline	33	10	50	"	1	"	"	"	"	J

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Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
15K11A (CXL1159-01) Water Sampled: 12/22/14 09:30 Received: 12/22/14 17:20										
<i>Surrogate: Toluene-d8</i>	<i>102 %</i>		<i>72-125</i>	µg/L		<i>CX09227</i>	12/29/14	12/29/14	<i>EPA 8260B</i>	
Benzene	ND	0.11	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.10	0.50	"	1	"	"	"	"	
Toluene	ND	0.11	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.33	1.0	"	1	"	"	"	"	
TANK1-E (CXL1159-02) Water Sampled: 12/22/14 09:45 Received: 12/22/14 17:20										
<i>Surrogate: Toluene-d8</i>	<i>105 %</i>		<i>72-125</i>	µg/L		<i>CX09227</i>	12/29/14	12/29/14	<i>EPA 8260B</i>	
Benzene	ND	0.11	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.10	0.50	"	1	"	"	"	"	
Toluene	ND	0.11	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.33	1.0	"	1	"	"	"	"	
15A11A (CXL1159-03) Water Sampled: 12/22/14 10:50 Received: 12/22/14 17:20										
<i>Surrogate: Toluene-d8</i>	<i>101 %</i>		<i>72-125</i>	µg/L		<i>CX09227</i>	12/29/14	12/30/14	<i>EPA 8260B</i>	
Benzene	ND	0.11	0.50	"	1	"	"	"	"	
Ethylbenzene	ND	0.10	0.50	"	1	"	"	"	"	
Toluene	ND	0.11	0.50	"	1	"	"	"	"	
Xylenes (total)	ND	0.33	1.0	"	1	"	"	"	"	

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Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX09174 - EPA 3510B GCNV

Blank (CX09174-BLK1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0251			mg/L	0.0250		101	65-135			
Diesel	ND	0.0021	0.050	"							
Motor Oil	ND	0.0091	0.050	"							
Hydraulic Oil	ND	0.030	0.050	"							
Mineral Oil	ND	0.020	0.050	"							
Kerosene	ND	0.0036	0.050	"							

LCS (CX09174-BS1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0246			mg/L	0.0250		98	65-135			
Diesel	3.03	0.0021	0.050	"	2.50		121	65-135			

LCS Dup (CX09174-BSD1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0211			mg/L	0.0250		84	65-135			
Diesel	2.88	0.0021	0.050	"	2.50		115	65-135	5	30	

Matrix Spike (CX09174-MS1)

Source: CXL1154-01

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0225			mg/L	0.0250		90	65-135			
Diesel	3.00	0.0021	0.050	"	2.50	ND	120	46-137			

Matrix Spike Dup (CX09174-MSD1)

Source: CXL1154-01

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Terphenyl	0.0242			mg/L	0.0250		97	65-135			
Diesel	2.91	0.0021	0.050	"	2.50	ND	116	46-137	3	30	

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Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

TPH-Gasoline by GC FID - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch CX09177 - EPA 5030 Water GC

Blank (CX09177-BLK1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Chlorotoluene (Gas)	17.6			µg/L	20.0		88	65-135		
Gasoline	ND	10	50	"						

LCS (CX09177-BS1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Chlorotoluene (Gas)	19.5			µg/L	20.0		97	65-135		
Gasoline	439	10	50	"	500		88	70-130		

LCS Dup (CX09177-BSD1)

Prepared: 12/24/14 Analyzed: 12/26/14

Surrogate: o-Chlorotoluene (Gas)	19.7			µg/L	20.0		98	65-135		
Gasoline	448	10	50	"	500		90	70-130	2	30

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Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

Volatile Organic Compounds by EPA Method 8260B - Quality Control

CLS Labs

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CX09227 - EPA 5030 Water MS

Blank (CX09227-BLK1)

Prepared & Analyzed: 12/29/14

Surrogate: Toluene-d8	11.2			µg/L	10.0		112	72-125			
Di-isopropyl ether	ND	0.15	0.50	"							
Ethyl tert-butyl ether	ND	0.062	0.50	"							
Methyl tert-butyl ether	ND	0.095	0.50	"							
tert-Amyl methyl ether	ND	0.078	0.50	"							
tert-Butyl alcohol	ND	2.2	5.0	"							
Benzene	ND	0.11	0.50	"							
Toluene	ND	0.11	0.50	"							
Ethylbenzene	ND	0.10	0.50	"							
Xylenes (total)	ND	0.33	1.0	"							
Naphthalene	ND	0.21	0.50	"							

LCS (CX09227-BS1)

Prepared & Analyzed: 12/29/14

Surrogate: Toluene-d8	10.1			µg/L	10.0		101	72-125			
Methyl tert-butyl ether	12.6	0.095	0.50	"	20.0		63	52-130			
Benzene	21.9	0.11	0.50	"	20.0		110	52-130			

LCS Dup (CX09227-BSD1)

Prepared & Analyzed: 12/29/14

Surrogate: Toluene-d8	9.93			µg/L	10.0		99	72-125			
Methyl tert-butyl ether	15.9	0.095	0.50	"	20.0		79	52-130	23	30	
Benzene	23.6	0.11	0.50	"	20.0		118	52-130	7	30	

Matrix Spike (CX09227-MS1)

Source: CXL1154-01

Prepared: 12/29/14 Analyzed: 12/30/14

Surrogate: Toluene-d8	9.57			µg/L	10.0		96	72-125			
Methyl tert-butyl ether	40.9	0.095	0.50	"	20.0	6.10	174	52-140			QM-7
Benzene	22.3	0.11	0.50	"	20.0	ND	112	52-140			

Matrix Spike Dup (CX09227-MSD1)

Source: CXL1154-01

Prepared: 12/29/14 Analyzed: 12/30/14

Surrogate: Toluene-d8	9.19			µg/L	10.0		92	72-125			
Methyl tert-butyl ether	49.6	0.095	0.50	"	20.0	6.10	217	52-140	19	30	QM-7
Benzene	21.8	0.11	0.50	"	20.0	ND	109	52-140	2	30	

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12/30/14 11:28

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

Notes and Definitions

TPH-X Although the sample contains compounds in the retention time range of target parameter, the chromatogram was not consistent with the expected chromatographic pattern or "fingerprint". However, the reported concentration is based on the target parameter.

QM-7 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

J Detected but below the Reporting Limit; therefore, result is an estimated concentration.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

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12/30/14 11:28

Earth Resource Technologies c/o NASA-Ames
Bldg T20G-4, Room 135
Moffet Field CA, 94053-1000

Project: AOI 4 Quarterly O&M
Project Number: 3602-705
Project Manager: Brian Reddig

CLS Work Order #: CXL1159
COC #:

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY							CLS ID. NO. <u>CXL1159</u> (of)		
Report To:				Client Job Number 3602-705			ANALYSIS REQUESTED		
Name and Address Earth Resources Technology, Inc.				Destination Laboratory			GEOTRACKER		
NASA Ames Research Center							EDF REPORT <input type="checkbox"/> YES <input type="checkbox"/> NO		
Moffett Field, CA							GLOBAL ID		
Project Manager Brian Reddig (650) 604-1315				<input checked="" type="checkbox"/> CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com			FIELD CONDITIONS:		
Project Name AOI 4 Quarterly O&M							COMPOSITE:		
Sampled By Brian Reddig							TURNAROUND TIME IN DAYS		
Job Description Q4 2014 Sampling							SPECIAL INSTRUCTIONS		
Site Location Area of Investigation 4							1 2 5 10		
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE	TPH-G/BTEX	TPH-D, -JPS/B, -MO	
12/22/14	9:30	15K11A		Groundwater	4	Mixed	1,3	X X	
12/22/14	9:45	TANK1-E		Groundwater	4	Mixed	1,3	X X	
12/22/14	10:50	15A11A		Groundwater	4	mixed	1,3	X X	
INVOICE TO:									
POS									
QUOTE#									
SUSPECTED CONSTITUENTS				SAMPLE RETENTION TIME		PRESERVATIVES (1) HCL (3) = COLD (2) HNO ₃ (4)			
RELINQUISHED BY (Signature)		PRINT NAME/COMPANY		DATE/TIME		RECEIVED BY (Signature)		PRINT NAME/COMPANY	
<i>Brian Reddig</i>		Brian Reddig/ERT		12/24/14		<i>[Signature]</i>		[Signature]	
RECEIVED AT LAB BY:				DATE/TIME: 12/22/14		CONDITIONS/COMMENTS: 1.9			
SHIPPED BY:				<input checked="" type="checkbox"/> FED EX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER		AIRBILL #			

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APPENDIX G

MANN-KENDALL TREND ANALYSIS

MANN-KENDALL TREND ANALYSIS

Mann-Kendall trends were evaluated using the ProUCL 5.0 software developed by the EPA. Concentration trends were evaluated for TCE, *cis*-1,2-DCE, and vinyl chloride. Trends were evaluated based on the period between December 2001 and December 2013, which coincides with NASA's initiation of groundwater extraction.

Results of the Mann-Kendall trend analysis were used to categorize the trend behavior of each compound at a well based on the following statistical criteria:

Trend	Mann-Kendall Statistic (MKS)	Confidence in the Trend (CT)	Coefficient of Variation (COV)
Decreasing (D)	<0	>95%	N/A
Probably Decreasing (PD)	<0	90-95%	N/A
Stable (S)	≤0	<90%	<1
No Trend (NT)	≤0	<90%	≥1
	>0	<90%	N/A
Probably Increasing (PI)	>0	90-95%	N/A
Increasing (I)	>0	>95%	N/A
Not Applicable (NA)	---	---	---

The following assumptions were used in evaluating the data:

- The designation of “ND” (Not Detect) was used when greater than 90% of the analytical results were below detection levels for a specific chemical in a specific well.
- The designation “IQD” (Insufficient Quantifiable Data) was used when 50-90% of the analytical results were below detection levels for a specific chemical in a specific well.
- When ND values were present in less than 50% of the analytical results for a specific chemical in a specific well, half of the Reporting Limit was used for statistical analysis purposes.

Table G-1 provides a listing by well of the trend assignment generated by ProUCL for TCE, *cis*-1,2-DCE, and vinyl chloride.

Table G-1
Mann-Kendall Concentration Trends

Wells Within NASA's Area of Responsibility

Well Name	TCE	cis-1,2-DCE	Vinyl Chloride
11E02A	D	D	ND
11M03A	S	IQD	ND
11M14A1	S	PI	ND
11M16A1	S	S	ND
11M17A	I	S	ND
11M18A1	S	S	ND
11M21A	D	D	ND
11M25A	S	ND	ND
11N21A1	D	D	IQD
11N22A1	S	D	IQD
11N26A	ND	ND	ND
14D24A	S	PD	D
14D26A1	S	S	IQD
14D37A	ND	ND	IQD
95A	D	D	IQD
NASA-1A	D	D	D
NASA-3A	D	D	ND
W08-08A1	S	IQD	ND

Wells Up-Gradient of NASA's Area of Responsibility

Well Name	TCE	cis-1,2-DCE	Vinyl Chloride
14C60A	ND	S	D
14D02A	ND	S	ND
14D09A	S	I	I
14D13A	I	I	ND
14D28A	I	S	S
14D33A	ND	ND	PI
14D35A	IQD	I	S
14D36A	D	D	S
14E14A	I	I	ND
15H05A	IQD	S	ND

Notes:

TCE = Trichloroethene

Cis-1,2-DCE = cis-1,2-Dichloroethene

ND = Not Detected

IQD = Insufficient Quantifiable Data

S = Stable

I = Increasing

PI = Probably Increasing

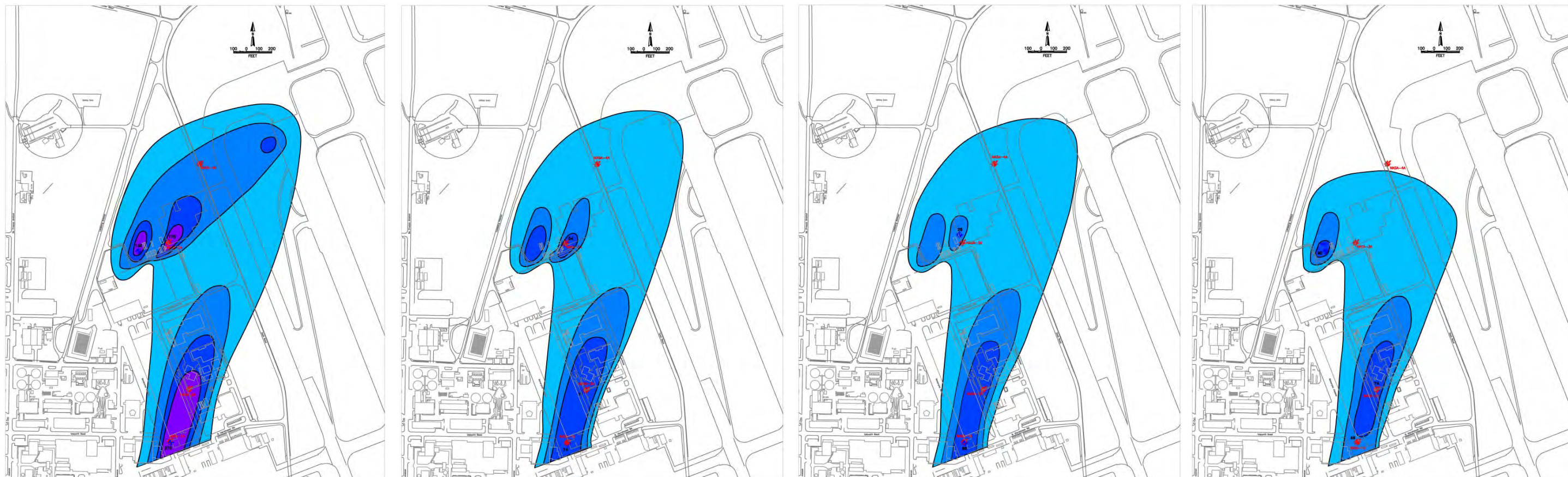
D = Decreasing

PD = Probably Decreasing



APPENDIX H

Time Series Plume Maps



1995

2000

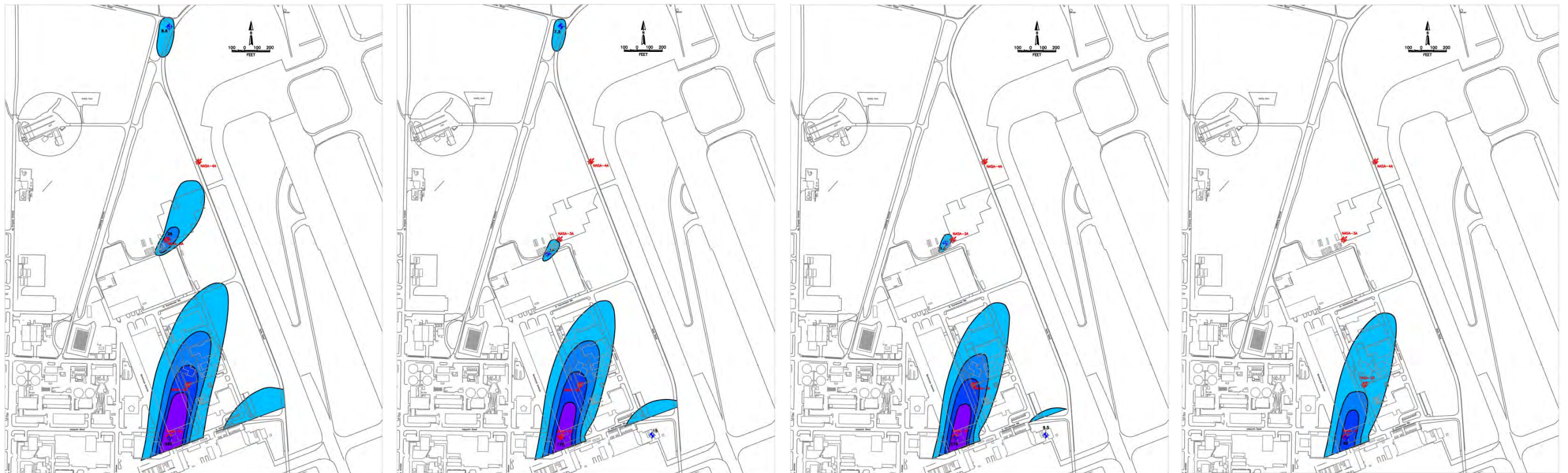
2007

2013

TCE Concentrations (ug/L)



Figure H-1
TCE Iso-Concentration Contours



1995

2000

2007

2013

cis-1,2-DCE Concentrations (ug/L)



6-25 ug/L



25-50 ug/L



50-100 ug/L



>100 ug/L

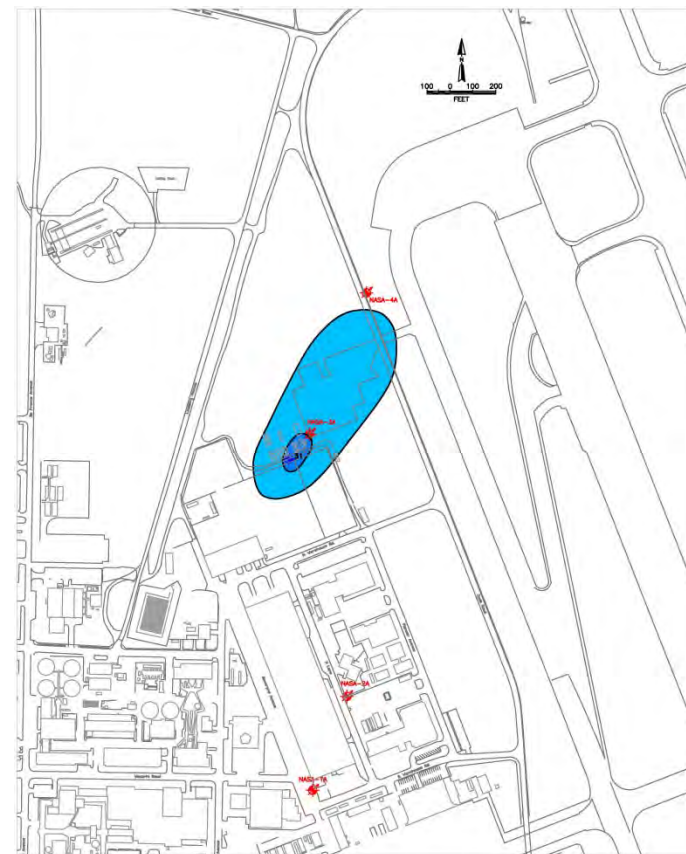
Figure H-2
Cis-1,2-DCE Iso-Concentration Contours



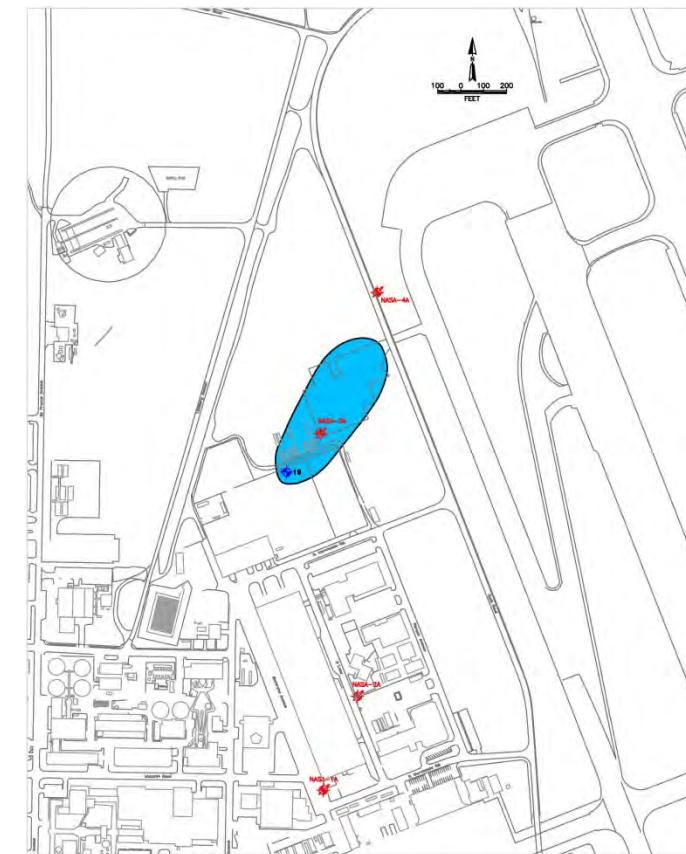
1995



2000



2007



2013

1,1-DCE Concentrations (ug/L)



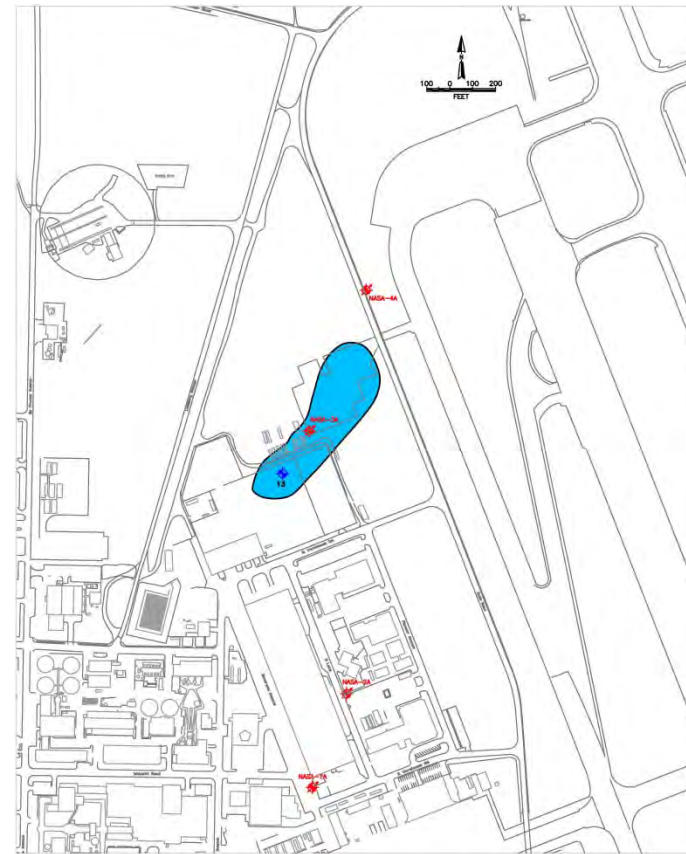
Figure H-3
1,1-DCE Iso-Concentration Contours



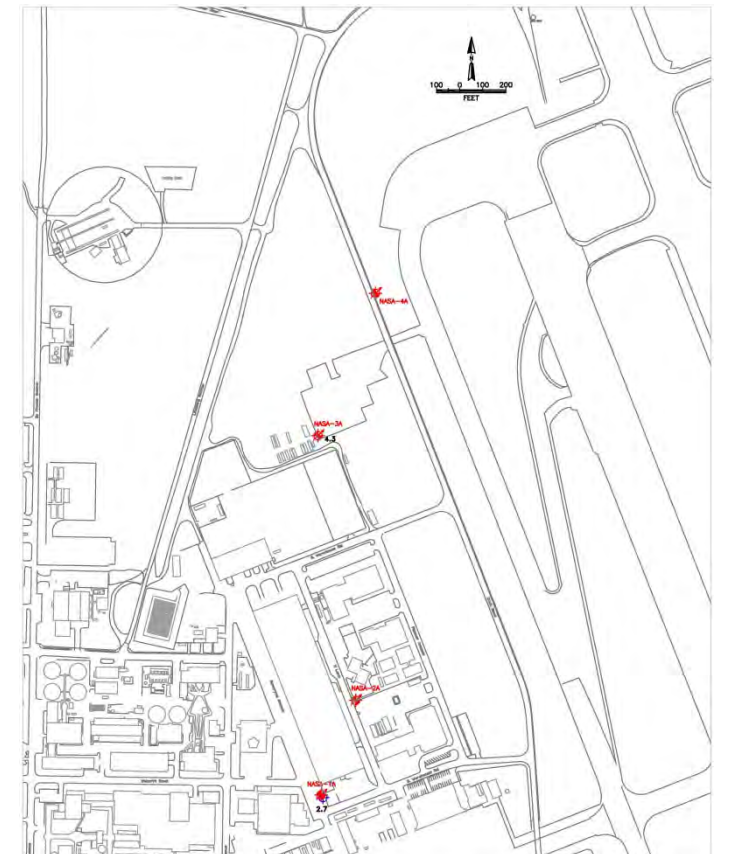
1995



2000



2007



2013

1,1-DCA Concentrations (ug/L)



5-25 ug/L



25-50 ug/L

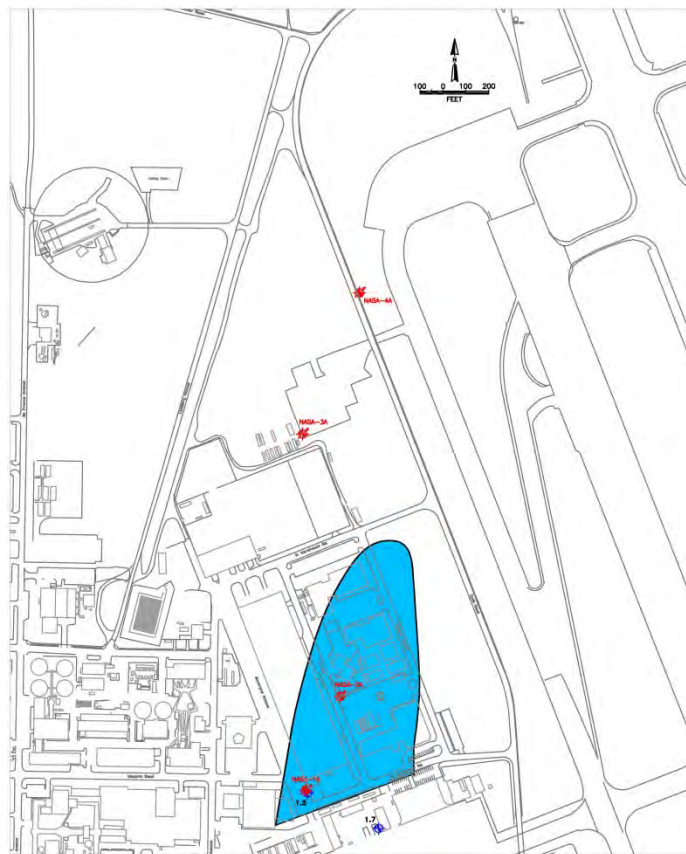


50-100 ug/L

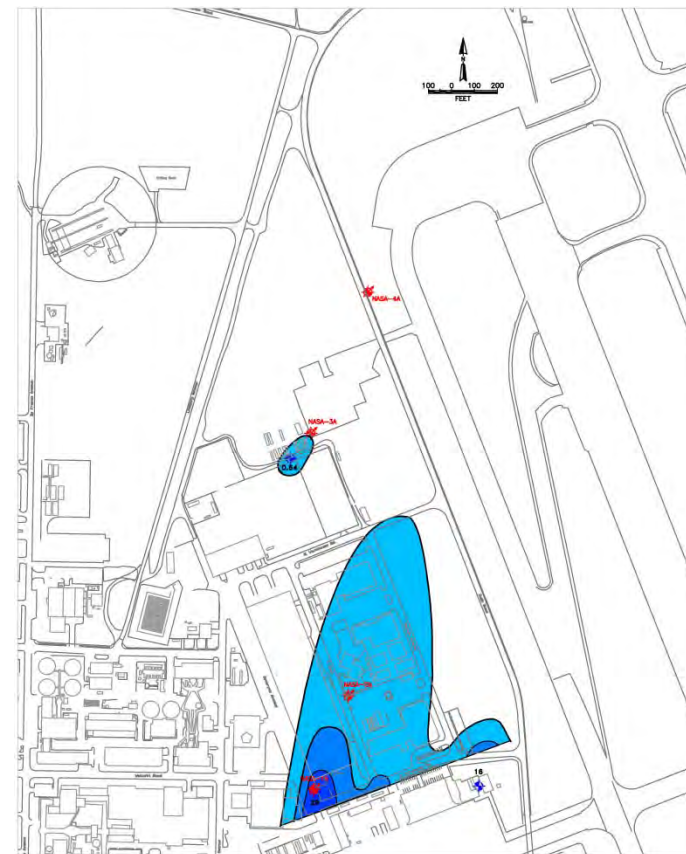


>100 ug/L

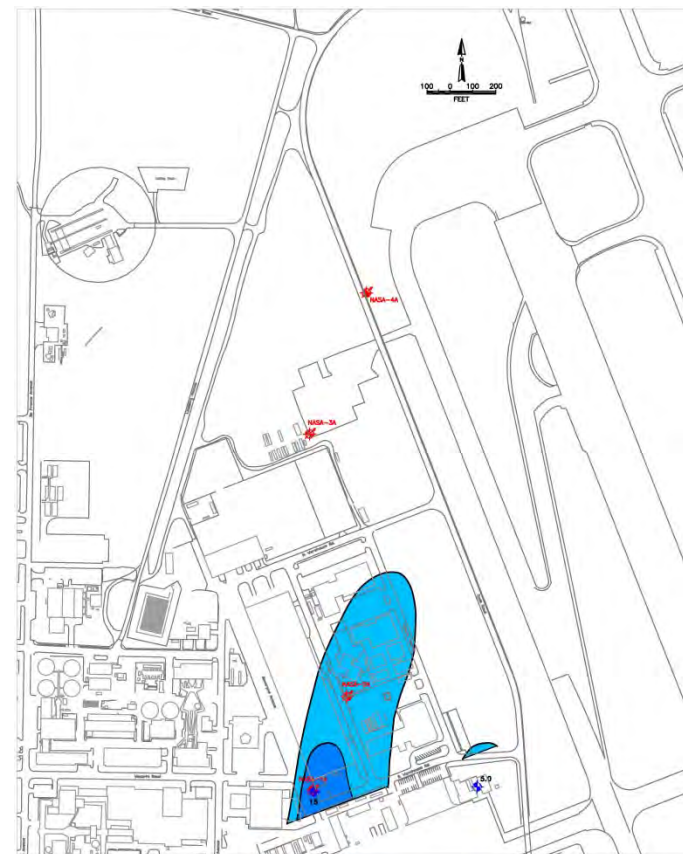
Figure H-4
1,1-DCA Iso-Concentration Contours



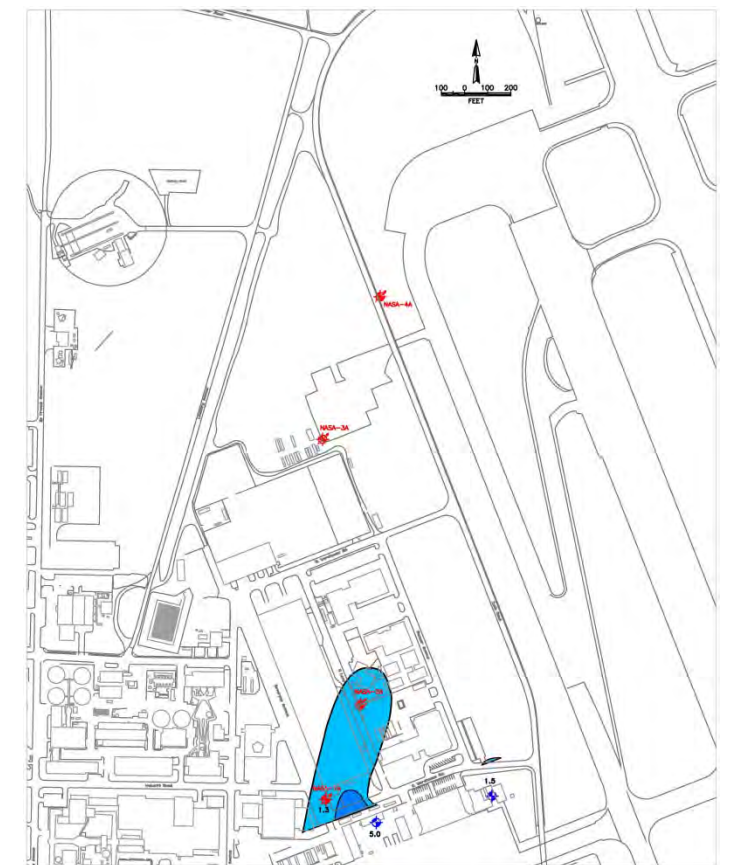
1995



2000



2007



2013

VC Concentrations (ug/L)



0.5–2.5 ug/L



2.5–5 ug/L



>5 ug/L

Figure H-5
Vinyl Chloride Iso-Concentration Contours